ENVIRONMENTAL SERVICES
SPB05-894P-C

1. PARTIES

THIS CONTRACT, is entered into by and between the State of Montana, Department of Administration, State Procurement Bureau, (hereinafter referred to as "the State"), whose address and phone number are Room 165 Mitchell Building, 125 North Roberts, PO Box 200135, Helena MT 59620-0135, (406) 444-2575 and **Northern Analytical Laboratories, Inc.**, (hereinafter referred to as the "Contractor"), whose nine digit Federal ID Number, address and phone number are 81-0526286, 602 South 25th Street, Billings, MT 59101 and (406) 254-7226.

THE PARTIES AGREE AS FOLLOWS:

2. EFFECTIVE DATE, DURATION, AND RENEWAL

2.1 Contract Term. This contract shall take effect upon execution of all signatures, and terminate on June 30, 2007, unless terminated earlier in accordance with the terms of this contract. (Mont. Code Ann. § 18-4-313.)

2.2 Contract Renewal. This contract may, upon mutual agreement between the parties and according to the terms of the existing contract, be renewed in one-year intervals, or any interval that is advantageous to the State, for a period not to exceed a total of four additional years. This renewal is dependent upon legislative appropriations.

2.3 Addition of Analytical Laboratory Contractor. Proposals will be accepted between April 1 and May 1 of each calendar year from current firms requesting review of their qualifications to perform Analytical Laboratory Services as originally requested under RFP SPB05-894P. The state will evaluate each proposal received in the exact manner in which the original proposals for other categories were evaluated. If proposal passes the requirements as evaluated to perform Analytical Lab Services, the state will update that firms term contract to include the Analytical Lab Services category contingent on said firm being in good standing otherwise.

3. NON-EXCLUSIVE CONTRACT

The intent of this contract is to provide state agencies with an expedited means of procuring supplies and/or services. This contract is for the convenience of state agencies and is considered by the State Procurement Bureau to be a "Non-exclusive" use contract. Therefore, agencies may obtain this product/service from sources other than the contract holder(s) as long as they comply with Title 18, MCA, and their delegation agreement. The State Procurement Bureau does not guarantee any usage.

4. COOPERATIVE PURCHASING

Under Montana law, public procurement units, as defined in section 18-4-401, MCA, have the option of cooperatively purchasing with the State of Montana. Public procurement units are defined as local or state public procurement units of this or any other state, including an agency of the United States, or a tribal procurement unit. Unless the bidder/offeror objects, in writing, to the State Procurement Bureau prior to the award of this contract, the prices, terms, and conditions of this contract will be offered to these public procurement units.

5. TERM CONTRACT REPORTING

Term contract holder(s) shall furnish annual reports of term contract usage. Each report shall contain complete information on all public procurement units utilizing this term contract. Minimum information required to be included in usage reports: name of the agency or governmental entity who contacted you regarding a potential project; project title; agency contact person; if the project was not successfully negotiated, state the reason; number and title of contracts received; total dollar amounts for contracts received; the names of your company

personnel involved in the project; and project status as of usage report date. The report for this term contract will be due on July 20th of each year.

Reported volumes and dollar totals may be checked by the State Procurement Bureau against State records for verification. Failure to provide timely or accurate reports is justification for cancellation of the contract and/or justification for removal from consideration for award of contracts by the State.

6. COST/PRICE ADJUSTMENTS

6.1 Cost Increase by Mutual Agreement. After the initial term of the contract, each renewal term may be subject to a cost increase by mutual agreement. Contractor must provide written, verifiable justification for any cost adjustments they request during each renewal period. Contractor shall provide its cost adjustments in both written and electronic format.

6.2 Differing Site Conditions. If, during the term of this contract, circumstances or conditions are materially different than set out in the specifications, the Contractor may be entitled to an equitable adjustment in the contract price. The Contractor shall immediately cease work and notify, in writing, the State of any such conditions necessitating an adjustment as soon as they are suspected and prior to the changed conditions affecting the performance of this contract. Any adjustment shall be agreed upon in writing by both parties to the contract.

6.3 Cost/Price Adjustment. All requests for cost/price adjustment must be submitted between April 1st and April 30th along with written justification. Requests received after April 30th will not be considered unless written approval from the SPB Contracts Officer is given to submit at a later date. In no event will cost/price adjustments be allowed beyond May 15th. All requests that are approved will be incorporated by contract amendment and made effective July 1st of the next approved renewal period.

7. SERVICES AND/OR SUPPLIES

7.1 Description of Services. Contractor agrees to provide to the State analytical laboratory services as detailed in Attachment A. The analytical laboratories used by the State, in particular the Montana Department of Environmental Quality (DEQ) Non-Point Source Program, its contractors and grantees must meet minimum qualifications with the services that they provide, the quality system that they operate under and their ability to provide the information in a useable format. The quality system and deliverable format (STORET) requirements are pass-through requirements of the funding that DEQ receives, in whole or part, from the EPA.

The scope of analytical services required by the NPS program is very broad and can include, but is not limited to: ambient water testing, wastewater analyses, drinking water testing, standing crop/algae/chlorophyll a, sediment characterization, waste characterization, radiochemistry, etc.

7.2 Reuse of Documents. When the projects dictate a design or engineered approach, the State agrees that it will not apply the Contractor's designs to any other projects.

8. CONSIDERATION/PAYMENT

8.1 Payment Schedule. In consideration for the services to be provided, the State shall pay according to the negotiated agreement for each project. Hourly rates and miscellaneous charges as provided in Attachment B shall apply.

8.2 Withholding of Payment. The State may withhold payments to the Contractor if the Contractor has not performed in accordance with this contract. Such withholding cannot be greater than the additional costs to the State caused by the lack of performance.

9. CONTRACTOR WITHHOLDING

Section 15-50-206, MCA, requires the state agency or department for whom a public works construction contract over $5,000 is being performed, to withhold 1 percent of all payments and to transmit such monies to the Department of Revenue.

10. MONTANA PREVAILING WAGE REQUIREMENTS

Unless superseded by federal law, Montana law requires that contractors and subcontractors give preference to the employment of Montana residents for any public works contract in excess of $25,000 for construction or nonconstruction services in accordance with sections 18-2-401 through 18-2-432, MCA, and all administrative rules adopted pursuant thereto. Unless superseded by federal law, at least 50% of the workers of each contractor engaged in construction services must be performed by bona fide Montana residents. The Commissioner of the Montana Department of Labor and Industry has established the resident requirements in accordance with sections 18-2-403 and 18-2-409, MCA. Any and all questions concerning prevailing wage and Montana resident issues should be directed to the Montana Department of Labor and Industry.

In addition, unless superseded by federal law, all employees working on a public works contract shall be paid prevailing wage rates in accordance with sections 18-2-401 through 18-2-432, MCA, and all administrative rules adopted pursuant thereto. Montana law requires that all public works contracts, as defined in section 18-2-401, MCA, in which the total cost of the contract is in excess of $25,000, contain a provision stating for each job classification the standard prevailing wage rate, including fringe benefits, travel, per diem, and zone pay that the contractors, subcontractors, and employers shall pay during the public works contract.

Furthermore, section 18-2-406, MCA, requires that all contractors, subcontractors, and employers who are performing work or providing services under a public works contract post in a prominent and accessible site on the project staging area or work area, no later than the first day of work and continuing for the entire duration of the contract, a legible statement of all wages and fringe benefits to be paid to the employees in compliance with section 18-2-423, MCA. Section 18-2-423, MCA, requires that employees receiving an hourly wage must be paid on a weekly basis.

Each contractor, subcontractor, and employer must maintain payroll records in a manner readily capable of being certified for submission under section 18-2-423, MCA, for not less than three years after the contractor's, subcontractor's, or employer's completion of work on the public works contract.

The nature of the work performed or services provided under this contract meets the statutory definition of a "public works contract" under section 18-2-401(11)(a), MCA, and falls under the category of Heavy Construction and Nonconstruction services. The booklets containing Montana's 2003 Rates for Heavy Construction and Nonconstruction Services are attached.

11. ACCESS AND RETENTION OF RECORDS

11.1 Access to Records. The Contractor agrees to provide the State, Legislative Auditor or their authorized agents access to any records necessary to determine contract compliance. (Mont. Code Ann. § 18-1-118.)

11.2 Retention Period. The Contractor agrees to create and retain records supporting the environmental services for a period of three years after either the completion date of this contract or the conclusion of any claim, litigation or exception relating to this contract taken by the State of Montana or a third party.

12. ASSIGNMENT, TRANSFER AND SUBCONTRACTING

The Contractor shall not assign, transfer or subcontract any portion of this contract without the express written consent of the State. (Mont. Code Ann. § 18-4-141.) The Contractor shall be responsible to the State for the acts and omissions of all subcontractors or agents and of persons directly or indirectly employed by such

subcontractors, and for the acts and omissions of persons employed directly by the Contractor. No contractual relationships exist between any subcontractor and the State.

13. HOLD HARMLESS/INDEMNIFICATION

The Contractor agrees to protect, defend, and save the State, its elected and appointed officials, agents, and employees, while acting within the scope of their duties as such, harmless from and against all claims, demands, causes of action of any kind or character, including the cost of defense thereof, arising in favor of the Contractor's employees or third parties on account of bodily or personal injuries, death, or damage to property arising out of services performed or omissions of services or in any way resulting from the acts or omissions of the Contractor and/or its agents, employees, representatives, assigns, subcontractors, except the sole negligence of the State, under this agreement.

14. REQUIRED INSURANCE

14.1 General Requirements. The Contractor shall maintain for the duration of the contract, at its cost and expense, insurance against claims for injuries to persons or damages to property, including contractual liability, which may arise from or in connection with the performance of the work by the Contractor, agents, employees, representatives, assigns, or subcontractors. This insurance shall cover such claims as may be caused by any negligent act or omission.

14.2 Primary Insurance. The Contractor's insurance coverage shall be primary insurance as respect to the State, its officers, officials, employees, and volunteers and shall apply separately to each project or location. Any insurance or self-insurance maintained by the State, its officers, officials, employees or volunteers shall be excess of the Contractor's insurance and shall not contribute with it.

14.3 Specific Requirements for Commercial General Liability. The Contractor shall purchase and maintain occurrence coverage with combined single limits for bodily injury, personal injury, and property damage of $1,000,000 per occurrence and $2,000,000 aggregate per year to cover such claims as may be caused by any act, omission, or negligence of the Contractor or its officers, agents, representatives, assigns or subcontractors.

14.4 Additional Insured Status. The State, its officers, officials, employees, and volunteers are to be covered and listed as additional insureds; for liability arising out of activities performed by or on behalf of the Contractor, including the insured's general supervision of the Contractor; products and completed operations; premises owned, leased, occupied, or used.

14.5 Specific Requirements for Automobile Liability. The Contractor shall purchase and maintain coverage with split limits of $500,000 per person (personal injury), $1,000,000 per accident occurrence (personal injury), and $100,000 per accident occurrence (property damage), OR combined single limits of $1,000,000 per occurrence to cover such claims as may be caused by any act, omission, or negligence of the contractor or its officers, agents, representatives, assigns or subcontractors.

14.6 Additional Insured Status. The State, its officers, officials, employees, and volunteers are to be covered and listed as additional insureds for automobiles leased, hired, or borrowed by the Contractor.

14.7 Specific Requirements for Professional Liability. The Contractor shall purchase and maintain occurrence coverage with combined single limits for each wrongful act of $1,000,000 per occurrence and $2,000,000 aggregate per year to cover such claims as may be caused by any act, omission, negligence of the Contractor or its officers, agents, representatives, assigns or subcontractors. Note: if "occurrence" coverage is unavailable or cost prohibitive, the Contractor may provide "claims made" coverage provided the following conditions are met: (1) the commencement date of the contract must not fall outside the effective date of insurance coverage and it will be the retroactive date for insurance coverage in future years; and (2) the claims made policy must have a three year tail for claims that are made (filed) after the cancellation or expiration date of the policy.

14.8 Deductibles and Self-Insured Retentions. Any deductible or self-insured retention must be declared to and approved by the state agency. At the request of the agency either: (1) the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the State, its officers, officials, employees, or volunteers; or (2) at the expense of the Contractor, the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claims administration, and defense expenses.

14.9 Certificate of Insurance/Endorsements. A certificate of insurance from an insurer with a Best's rating of no less than A- indicating compliance with the required coverages, has been received by the State Procurement Bureau, PO Box 200135, Helena MT 59620-0135. The Contractor must notify the State immediately, of any material change in insurance coverage, such as changes in limits, coverages, change in status of policy, etc. The State reserves the right to require complete copies of insurance policies at all times.

15. COMPLIANCE WITH THE WORKERS' COMPENSATION ACT

Contractors are required to comply with the provisions of the Montana Workers' Compensation Act while performing work for the State of Montana in accordance with sections 39-71-120, 39-71-401, and 39-71-405, MCA. Proof of compliance must be in the form of workers' compensation insurance, an independent contractor's exemption, or documentation of corporate officer status. Neither the contractor nor its employees are employees of the State. This insurance/exemption must be valid for the entire term of the contract. A renewal document must be sent to the State Procurement Bureau, PO Box 200135, Helena MT 59620-0135, upon expiration.

16. COMPLIANCE WITH LAWS

The Contractor must, in performance of work under this contract, fully comply with all applicable federal, state, or local laws, rules and regulations, including the Montana Human Rights Act, the Civil Rights Act of 1964, the Age Discrimination Act of 1975, the Americans with Disabilities Act of 1990, and Section 504 of the Rehabilitation Act of 1973. Any subletting or subcontracting by the Contractor subjects subcontractors to the same provision. In accordance with section 49-3-207, MCA, the Contractor agrees that the hiring of persons to perform the contract will be made on the basis of merit and qualifications and there will be no discrimination based upon race, color, religion, creed, political ideas, sex, age, marital status, physical or mental disability, or national origin by the persons performing the contract.

17. INTELLECTUAL PROPERTY

All patent and other legal rights in or to inventions created in whole or in part under this contract must be available to the State for royalty-free and nonexclusive licensing. Both parties shall have a royalty-free, nonexclusive, and irrevocable right to reproduce, publish or otherwise use and authorize others to use, copyrightable property created under this contract.

18. PATENT AND COPYRIGHT PROTECTION

18.1 Third Party Claim. In the event of any claim by any third party against the State that the products furnished under this contract infringe upon or violate any patent or copyright, the State shall promptly notify Contractor. Contractor shall defend such claim, in the State's name or its own name, as appropriate, but at Contractor's expense. Contractor will indemnify the State against all costs, damages and attorney's fees that accrue as a result of such claim. If the State reasonably concludes that its interests are not being properly protected, or if principles of governmental or public law are involved, it may enter any action.

18.2 Product Subject of Claim. If any product furnished is likely to or does become the subject of a claim of infringement of a patent or copyright, then Contractor may, at its option, procure for the State the right to continue using the alleged infringing product, or modify the product so that it becomes non-infringing. If none of the above options can be accomplished, or if the use of such product by the State shall be prevented by injunction, the State will determine if the Contract has been breached.

19. CONTRACT TERMINATION

19.1 Termination for Cause. The State may, by written notice to the Contractor, terminate this contract in whole or in part at any time the Contractor fails to perform this contract.

19.2 Reduction of Funding. The State, at its sole discretion, may terminate or reduce the scope of this contract if available funding is reduced for any reason. (See Mont. Code Ann. § 18-4-313(3).)

20. STATE PERSONNEL

20.1 State Contract Manager. The State Contract Manager identified below is the State's single point of contact and will perform all contract management pursuant to section 2-17-512, MCA, on behalf of the State. Written notices, requests, complaints or any other issues regarding the contract should be directed to the State Contract Manager.

The State Contract Manager for this contract is:

Robert Oliver, Contracts Officer
Room 165 Mitchell Building
125 North Roberts
PO Box 200135
Helena MT 59620-0135
Telephone #: (406) 444-0110
Fax #: (406) 444-2529
E-mail: roliver@mt.gov

20.2 State Project Manager. Each using State agency or Cooperative Purchaser will identify a Project Manager in the project task order. The Project Manager will manage the day-to-day project activities on behalf of the State/Cooperative Purchaser.

21. CONTRACTOR PERSONNEL

21.1 Change of Staffing. Since qualifications of personnel were key in determining which offerors were selected to be on this TC, a written notification of any changes in key personnel must be made to the state agency, prior to entering into negotiations to perform any specific work scope. Contractor shall replace such employee(s) at its own expense with an employee of substantially equal abilities and qualifications without additional cost to the agency. If these staffing changes cause the contractor to no longer meet the qualifications stated herein, that firm will be removed from the service area of this TC. Failure to notify the state agency of staffing changes could result in the contractor being removed from the TC listing and possible suspension from bidding on other state projects.

21.2 Contractor Contract Manager. The Contractor Contract Manager identified below will be the single point of contact to the State Contract Manager and will assume responsibility for the coordination of all contract issues under this contract. The Contractor Contract Manager will meet with the State Contract Manager and/or others necessary to resolve any conflicts, disagreements, or other contract issues.

The Contractor Contract Manager for this contract is:

Kathleen A. Smit
602 South 25th Street
Billings MT 59101
Telephone #: (406) 254-7226
Fax #: (406) 254-1389
E-mail: nlabs@wtp.net

21.3 Contractor Project Manager. The Contractor Project Manager identified below will manage the day-to-day project activities on behalf of the Contractor:

The Contractor Project Manager for this contract is:

Kathleen A. Smit
602 South 25th Street
Billings MT 59101
Telephone #: (406) 254-7226
Fax #: (406) 254-1389
E-mail: nlabs@wtp.net

22. MEETINGS

The Contractor is required to meet with the State's personnel, or designated representatives, to resolve technical or contractual problems that may occur during the term of the contract or to discuss the progress made by Contractor and the State in the performance of their respective obligations, at no additional cost to the State. Meetings will occur as problems arise and will be coordinated by the State. The Contractor will be given a minimum of three full working days notice of meeting date, time, and location. Face-to-face meetings are desired. However, at the Contractor's option and expense, a conference call meeting may be substituted. Consistent failure to participate in problem resolution meetings two consecutive missed or rescheduled meetings, or to make a good faith effort to resolve problems, may result in termination of the contract.

23. CONTRACTOR PERFORMANCE ASSESSMENTS

The State may do assessments of the Contractor's performance. This contract may be terminated for one or more poor performance assessments. Contractors will have the opportunity to respond to poor performance assessments. The State will make any final decision to terminate this contract based on the assessment and any related information, the Contractor's response and the severity of any negative performance assessment. The Contractor will be notified with a justification of contract termination. Performance assessments may be considered in future solicitations.

24. TRANSITION ASSISTANCE

If this contract is not renewed at the end of this term, or is terminated prior to the completion of a project, or if the work on a project is terminated, for any reason, the Contractor must provide for a reasonable period of time after the expiration or termination of this project or contract, all reasonable transition assistance requested by the State, to allow for the expired or terminated portion of the services to continue without interruption or adverse effect, and to facilitate the orderly transfer of such services to the State or its designees. Such transition assistance will be deemed by the parties to be governed by the terms and conditions of this contract, except for those terms or conditions that do not reasonably apply to such transition assistance. The State shall pay the Contractor for any resources utilized in performing such transition assistance at the most current rates provided by the contract. If there are no established contract rates, then the rate shall be mutually agreed upon. If the State terminates a project or this contract for cause, then the State will be entitled to offset the cost of paying the Contractor for the additional resources the Contractor utilized in providing transition assistance with any damages the State may have otherwise accrued as a result of said termination.

25. CHOICE OF LAW AND VENUE

This contract is governed by the laws of Montana. The parties agree that any litigation concerning this bid, proposal or subsequent contract must be brought in the First Judicial District in and for the County of Lewis and Clark, State of Montana and each party shall pay its own costs and attorney fees. (See Mont. Code Ann. § 18-1-401.)

26. SCOPE, AMENDMENT AND INTERPRETATION

26.1 Contract. This contract consists of eight numbered pages, RFP # SPB05-894P**,** as amended, Attachment A, Contractor's RFP response as amended, and Attachment B, Cost Proposal. In the case of dispute or ambiguity about the minimum levels of performance by the Contractor the order of precedence of document interpretation is in the same order.

26.2 Entire Agreement. These documents contain the entire agreement of the parties. Any enlargement, alteration or modification requires a written amendment signed by both parties.

27. EXECUTION

The parties through their authorized agents have executed this contract on the dates set out below.

DEPARTMENT OF ADMINISTRATION
STATE PROCUREMENT BUREAU
PO BOX 200135
HELENA MT 59620-0135

BY:_____
Penny Moon, Contracts Officer

BY:_____
(Signature)

DATE:_____

NORTHERN ANALYTICAL LABORATORIES INC.
602 SOUTH 25TH STREET
BILLINGS MT 59101
FEDERAL ID #81-0526286

BY:_____
(Name/Title)

BY:_____
(Signature)

DATE:_____

Section 4: Offeror Qualifications

4.1 Offeror Informational Requirements- All Service Categories

4.1.1 References

The following firms or agencies are using the services stipulated in this request for proposal.

Company or Agency Name: Montana Department of Environmental Quality (MDEQ)
Location services were provided: Soil and water samples are received from the Butte/Silverbow Creek Superfund site. Analysis is performed at our Billings laboratory with no subcontractors.
Contact person: Joel Chavez, P.O. Box 20091, Helena, MT 59620-0901
Customer telephone number: 406-841-5031
Complete description of service: Soil and water samples collected from the Butte/Silverbow Creek Superfund site are delivered to our laboratory for analysis on an as needed basis since May of 2002. The water samples are analyzed for target analytes similar to the list provided by the State of Montana in this request for proposal. Approximately 2400 soil samples were delivered in a period of 8 months in 2002 and approximately 650 soil samples were delivered over a period of 4 months in 2003 for trace metals analysis. Data is delivered to the MDEQ representative using a hard copy format and an electronic deliverable defined by the MDEQ.
Dates service was provided: 2002 through present

Company or Agency Name: URS Corporation
Location services were provided: Soil and water samples are received from the various projects on an as needed basis. Analysis is performed at our Billings laboratory with no subcontractors.
Contact person: Sheri O'Connor, 8181 Tufts Avenue, Denver, CO 80237
Customer telephone number: 303-740-3909
Complete description of service: Soil and water samples collected from various projects have been delivered to our laboratory for analysis on an as needed basis since May of 1996. The samples were analyzed for target analytes, which vary from project to project but include inorganics, metals and organic compounds. Data packages which include calibration, blank, accuracy and precision summaries and raw data delivered to the URS representative who then performs a complete validation of the data in accordance with the EPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review EPA–540/R-99/008 or National Functional Guidelines for Inorganic Data Review EPA-540/R-01-008 (Functional Guidelines). The data is delivered

using a hard copy format and electronic deliverables defined by URS or their client.
Dates service was provided: 1996 through present

Company or Agency Name: Southern Idaho Solid Waste District
Location services were provided: Samples were received from landfill property. Analysis was performed at our Billings laboratory with one subcontractor.
Contact person: Tom Miller, P.O. Box 159, Burley, ID 83318
Customer telephone number: 208-432-9082
Complete description of service: Water samples (approximately 8 per event) collected from landfill property were delivered to our laboratory for analysis on a semi-annual basis since 1996. The samples are analyzed for target analytes similar to the list provided by the State of Montana in this request for proposal. These analytes include trace metals, potassium, sodium, alkalinity, chloride, sulfate, chemical oxygen demand, nitrate+nitrite, and volatile organic compounds using reporting limits that are similar to Montana Water Quality Bureau Circular 7 requirements. Data is delivered to the district representative using a hard copy format. The subcontractor provides analysis of samples for Total Organic Carbon. A summary of their data is included in the tabulation of laboratory data for each sample and a copy of the subcontractor's report is submitted with our report to the client.
Dates service was provided: 1996 through present

Company or Agency Name: Western Energy Company
Location services were provided: Samples were received from mine areas. Analysis was performed at our Billings laboratory with no subcontractors.
Contact person: Nora Buchholz, P.O. Box 99, Colstrip, MT 59323
Customer telephone number: 406-748-5124
Complete description of service: Water samples (between 4 and 20 per event) collected by Western representatives were periodically delivered to our laboratory for analysis over the past three years. The samples are analyzed for target analytes similar to the list provided by the State of Montana in this request for proposal. These analytes include trace metals, calcium, magnesium, sodium, potassium, alkalinity, chloride, fluoride, sulfate, nitrate+nitrite, phosphorous, total dissolved solids, and total suspended solids. Cation and anion balances are measured as a step in the quality assurance effort. Reporting limits comply with Montana Water Quality Bureau Circular 7 requirements. Data is delivered to the Western representative using a hard copy format as well as an electronic deliverable in a format defined by Northern.
Dates service was provided: 2001 through present

Company or Agency Name: Tetratech, Inc.
Location services were provided: Samples were received from Tetratech representatives. Analysis was performed at our Billings laboratory with no subcontractors.

Contact person: John O'Donnell, 10306 Eaton Place, Fairfax, VA 22030
Customer telephone number: 703-385-6000 ext 121
Complete description of service: Water samples collected from the Tongue River and its tributaries were delivered to our laboratory for analysis on a monthly basis from April through September of 2003. The purpose of the analysis was to provide analytical data to support U.S.E.P.A.'s TMDL study of the river. Approximately 20 samples per month were analyzed for target analytes similar to the list provided by the State of Montana in this request for proposal. These analytes included chlorophyll a, trace metals, calcium, magnesium, sodium, alkalinity, fluoride, total kjeldahl nitrogen, nitrate+nitrite, phosphorous, total dissolved solids, total suspended solids and ammonia using reporting limits that comply with Montana Water Quality Bureau Circular 7 requirements.

Due to the project schedule and remote location of the sampling points, the samples were sometimes delivered at night or on weekends. Northern provided critical time services as required upon receipt of the samples. These critical time services included analysis of short holding time analytes such as soluble reactive phosphorous or filtration of samples for analysis for dissolved metals. The data was delivered to the Tetratech representative using a hard copy format, which included calibration summaries, summaries of analysis of quality control sample and raw data. The data was validated for use in the TMDL study by Tetratech. An electronic deliverable in the STORET format was provided to the client for each of the 6 sampling events.
Dates service was provided: 2003

4.1.2 Company Profile and Experience

Northern is a woman owned, small business which is certified as a disadvantaged small business by the Montana Department of Transportation. Our area of expertise is environmental and industrial hygiene laboratory services. Our role in this project will be to provide analytical laboratory services. Our experienced chemists, technicians and administrative support staff routinely provide the specific analytical services requested in this RFP with the exception of the radiochemistry requirements and organic carbon analysis. We would anticipate subcontracting these analyses should the MDEQ require us to provide services that we do not routinely offer.

Northern as a corporation has been in business since August 4, 1999, but our staff has worked as an environmental laboratory team at this location for many years under other ownerships. The laboratory has been in business since about 1962 and has been located at 600/602 South 25th Street in Billings, Montana since 1977. Our previous owners were Northern Testing Laboratories, Inc. (1962-1987), Huntingdon Engineering and Environmental, Inc. (1987-1995) and Maxim Technologies, Inc. (1995-1999). We employ approximately twenty to twenty five chemists, technicians and administrative support staff. Our current

and only location is 602 South 25th Street in Billings, Montana. You may contact Kathy Smit at 406-254-7226, P.O. Box 30315, Billings MT 59107 or nlabs@wtp.net with questions about this proposal.

Northern and the lab's previous owners have used EPA test methods and followed EPA protocols for more than twenty years. Our Quality Assurance (QA) plan which was based on EPA's guidance document for QA plans was written in 1982 and has been reviewed by EPA's laboratory certification representative on at least five occasions since that time. The laboratory has been continuously certified by EPA through the State of Montana to perform water analysis for the Safe Drinking Water Act since 1979. We have performed analyses of soil and water using EPA's Contract Lab Program Statement of Work (SOW) on projects since 1995 for EPA, the State of Idaho, the State of Montana and private sector clients. EPA Region VIII has contracted with us for environmental analysis on several occasions since 1995. The services provided by this lab since 1979 have been consistently related to environmental, industrial hygiene and product analyses.

Resumes for our key staff members are provided in the tabbed section labeled "Resumes".

4.1.3 Method of Providing Services and Quality Assurance

The key to our ability to successfully meet this project's technical and schedule goals will be the capacity of our equipment and the size of our staff. The technical nature of this project is not complex; we have much experience with this type of analytical work. The complexity of the project relates to the number of samples and the required holding times.

Using our work for Tetratech, Inc. (see referenced project in Section 4.1.1) as our example project, our work plan is described below. Our business is organized under two functions: a technical function and a business function. Our technical function is led by the laboratory manager (Kathy Smit) and is divided into four groups by the type of analysis performed. These groups are listed below with the group leader identified for each.

Inorganics Group.....Carol Corder
Metals Group.....Barb Hebert
Organics Group.....Carolyn Jones
Microscopy Group.....Kathy Smit

The technical group is supported by our quality assurance coordinator (Denise Jensen) and a project manager (Sara Sanderson). The business group is led by our corporation treasurer (Steve Smit) and clerical staff (Norma Trankle and Mary Walter). The business and technical functions work together to serve our clients

in a timely manner and in a way to produce quality results at a fair profit for the owners.

Scope, Objectives & Budget: The Tetratech project was managed in the same way the majority of our projects are managed. The laboratory manager reviewed the scope and objectives of the Request for Proposal (RFP) from Tetratech. The decision was made to respond to the RFP because we felt we were very capable of performing the work and meeting the client's objectives with reliable and timely results. This referenced project was specifically designed for the generation of TMDL data and required many of the same target analytes as this MDEQ RFP.

Before submitting a proposal to Tetratech, a draft budget was calculated. Using the draft budget, we assembled our fee proposal. This provided assurance from the beginning of the work that client expectations can be met within the monetary limits of our business. Having reviewed both technical and business aspects of the work, Northern submitted a proposal to Tetratech for the project and was awarded the work. When the contract was awarded to Northern, the sample log-in staff, quality assurance coordinator, project manager and group leaders each received copies of the scope of work from the contract. The business function stored the original copy of the contract for billing and insurance purposes. Within less than a week of being awarded the work, Tetratech employees were provided by Northern with the proper sample containers, preservatives, custody seals and other supplies. Within two weeks, the first set of samples was received for analysis at the lab.

Schedule: Each day project samples arrived at the laboratory, they were divided into delivery groups of twenty samples or less, and individually and uniquely numbered by the log-in personnel. The sample number assignment was checked by an analyst and the samples were transferred to the appropriate group for proper storage. The group leaders then scheduled the work according to the number of samples received and the holding time requirements. The laboratory manager resolved differences when schedule conflicts occurred or provided more staff to a particular group when needed. For the Tetratech project, we provided staff to receive samples, filter them for dissolved metals and chlorophyll tests and perform the ortho-phosphate analyses after hours and on weekends in order to strictly comply with the holding times of these tests.

In the days following the receipt of the samples, analysis of sets of the prepared samples was performed by chemists or technicians in the particular group where the work was assigned. A second chemist or technician was available to perform the work if the primary analyst was absent. When the analysis was complete, a peer to the analyst performing the work verified any calculations made by the analyst. The data was simultaneously provided to the quality assurance coordinator for review and electronically posted to the computer reporting system. In the event there were indicators in the quality control

samples that a particular analysis was not "in control", the quality assurance coordinator IMMEDIATELY advised the manager in writing through a Nonconformance Report. The quality coordinator advised corrective actions in accordance with the EPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review EPA–540/R-99/008 or National Functional Guidelines for Inorganic Data Review EPA-540/R-01-008 (Functional Guidelines). These corrective actions could include re-digestion (re-extraction) and a second analysis or appropriate notations in the final report case narrative and qualifiers (flags) on the laboratory data.

The analysis of the samples was generally complete in a two to three week period with corrective actions following within three to four weeks of receiving the samples. After any corrective actions were complete, the project manager or the quality assurance coordinator prepared our final report to Tetratech. This final report included a summary of the analysis results for each sample, all raw data generated, calibration, method blank and accuracy and precision summaries (commonly called a Level IV report). For most sample sets, our summary report was provided to Tetratech within four to five weeks of receipt of the samples. A report of sample results and quality control summaries was typically available at four weeks (commonly called a Level III report).

Managing Information: After the report was prepared by a project manager with assistance from the quality assurance coordinator, it was reviewed and signed by a second project manager. The data was then exported from our laboratory information management system into the STORET format using Microsoft Excel. This format was reviewed by a project manager for its content of items that were not previously reported in the Level IV data package. The STORET data was then electronically submitted to Tetratech's project manager via the Internet.

An invoice for our services was delivered with each Level IV report. Our business manager then followed the processing and payment of the invoices by Tetratech. Issues relating to payments, amounts due and other business matters were resolved between our business manager and the Tetratech representative without involving the technical staff.

Communications: Communication between Northern and Tetratech regarding technical matters was assigned to the lab manager (acting as the project manager).

4.1.4 Staff Qualifications

The following table provides a listing of the staff members who may participate in this project. Resumes for our staff members are provided in the tabbed section labeled "Resumes".

The management of this project will be assigned to Kathy Smit, laboratory manager with Sara Sanderson to act in her absence. Kathy has managed the laboratory since 1983 and has been co-owner since 1999. Her experience includes management of technical staff in their performance of lab analysis, quality assurance review and project management. She has identified, selected and purchased the major instruments used by the laboratory and understands their function and limitations. She has reviewed the lab's quality assurance manual on a periodic basis and approved it for publication. The assignment of lab staff, publication of fees and design and publication of written reports has been Kathy's responsibility since 1983.

Sara Sanderson will be assigned as Kathy's back-up for project management. Sara has worked in this position in the lab for three years. Her master's degree in environmental engineering and experience as an environmental consultant provide Northern with added understanding of the field work associated with the samples submitted for analysis. Her bachelor's degree in chemical engineering provides her with insight into the testing and analysis processes.

The metals group leader, Barb Hebert, and the inorganics group leader, Carol Corder, will be assigned day to day responsibility for the testing assignments to the lab staff. Barb and Carol have each been in these positions since before 1999.

Denise Jensen will perform the quality assurance coordinator function for this project. Denise has held the positions of chemist, supervisor and quality assurance coordinator in this lab. With a bachelor's degree in chemistry/biology and hands on use of most types of the instruments in our lab, Denise has a clear understanding of the function and capabilities of our staff and equipment. With more than ten years experience as quality assurance coordinator, Denise demonstrates a clear understanding of the quality assurance requirements made by EPA for compliance with the Clean Water Act, Safe Drinking Water Act, Resource Conservation and Recovery Act and the Contract Laboratory Program (CLP).

Table 1
Laboratory Staff Summary

Staff Member	Position Description	Degree	Years Experience	Years Experience on Similar Work	Specialty Training	Registrations
Brien, Teena	Lab technician	None	13	13	McCrone Institute asbestos training	None
Bottstein, Horst	Lab technician	None	12	12	Pittsburg Conference LIMS course. conference technical sessions	None
Bryn, Becky	Chemist	Bachelors	2	2	None	None
Corder, Carol	Chemist	Bachelors	19	19	Pittsburg Conference ion chromatography course, conference technical sessions	None
Dalby, Linda	Chemist	None	16	5	None	None
Dilley, Debbie	Chemist	Bachelors	13	5	Pittsburg Conference GC/MS course, conference technical sessions	None
Hebert, Barb	Chemist	Bachelors	13	13	CETAC ICP training Perkin Elmer ICP/MS training	None
Holm, Anna	Chemist	Bachelors	13	2	Cal Dept. of Agriculture pesticide training	None
Jensen, Denise	Quality Coordinator	Bachelors	16	16	Clemson University Quality Assurance course, NIOSH IH Laboratory Quality Control, USEPA national meetings (NELAC, QA Symposium)	None
Jones, Carolyn	Chemist	Bachelors	13	3	Pittsburg Conference GC/MS course, conference technical sessions	None
Klein, Marilyn	Chemist	Bachelors	5	2	Spectro ICP training	None
Otness, Mike	Lab technician	None	8	0	McCrone Institute asbestos training	None

Sanderson, Sara	Project Manager	Masters	3	3	See resume	None
Schreder, Eric	Chemist	Bachelors	Less than 1	Less than 1	None	None
Smit, Kathleen	Lab Manager	Bachelors	25	25	See resume	Certified Industrial Hygienist
Wilkins, Kim	Chemist	Bachelors	3	3	None	None
Walter, Mary	Lab Assistant	None	5	5	None	None
Smit, Steve	Business manager	None	4	4	None	None

4.2 Offeror Informational Requirements- Specific Service Categories

4.2.14 Analytical Laboratory Services

General

Related Experience

The following firms or agencies are using the specific analytical services stipulated in this request for proposal. Northern's specific area of expertise is the analysis of environmental samples, which would include surface, and groundwater analysis for projects relating to the current and historic impacts of mining and mineral extraction.

Company or Agency Name: Fort Belknap Community Council
Location services were provided: Samples were received from tribal representatives. Analysis was performed at our Billings laboratory with no subcontractors.
Contact person: Ina Nez Perce, R.R. 1 Box 66, Harlem, MT 59526
Customer telephone number: 406-353-8433
Complete description of service: Approximately 15 water samples collected from tribal lands were delivered to our laboratory for analysis on a monthly basis from March through October of each of the past five years. A new contract for these services was made with the Tribe for 2004. The samples are analyzed for target analytes similar to the list provided by the State of Montana in this request for proposal. These analytes include trace metals, calcium, magnesium, sodium, alkalinity, fluoride, cyanide, nitrate+nitrite, phosphorous, total dissolved solids, total suspended solids and ammonia using reporting limits that comply with Montana Water Quality Bureau Circular 7 requirements. Data is delivered to the tribal representative using a hard copy format as well as an electronic deliverable in the STORET format.
Dates service was provided: 1999 through present

Company or Agency Name: CHS, Inc. (Formerly Cenex Harvest States)
Location services were provided: Samples were received from refinery property. Analysis was performed at our Billings laboratory with no subcontractors.
Contact person: Ron Nissen, P.O. Box 909, Laurel, MT 59044-0909
Customer telephone number: 406-628-5384
Complete description of service: Water samples (as many as 50 per event) collected from refinery property are delivered to our laboratory for analysis on a semi-annual basis since 1998. The samples are analyzed for volatile and semivolatile organic compounds, iron and sulfate using methods approved for use for compliance with the Resource Conservation and Recovery Act. Data is delivered to the refinery representative using a hard copy format and an electronic deliverable in a format defined by the regulatory agency mandating the collection of the samples.
Dates service was provided: 1998 through present

Company or Agency Name: Fort Peck Assiniboine and Sioux Tribes

Location services were provided: Samples were received from tribal lands. Analysis was performed at our Billings laboratory with AMATEC, Inc. as our subcontractor.
Contact person: Chris Tyrrell and Sandra White Eagle P.O. Box 1027 Poplar, MT 59255
Customer telephone number: 406-768-5155
Complete description of service: Water samples collected from tribal lands were delivered to our laboratory for analysis on a monthly basis from March through October during the years 2002-present. The samples are analyzed for target analytes similar to the list provided by the State of Montana in this request for proposal for a nonpoint source study and an assessment of the upper Missouri River. These analytes include fecal coliform and e. coli, which is performed by our subcontractor AMATEC, Inc. Analytes measured by Northern include trace metals, calcium, magnesium, sodium, alkalinity, chloride, cyanide, nitrate+nitrite, phosphorous, total dissolved solids, total suspended solids and ammonia using reporting limits that comply with Montana Water Quality Bureau Circular 7 requirements. As few as one or as many as eight samples were delivered at any one time with requirements for analysis with very short holding times. These included ortho-phosphate and coliforms. Data is delivered to the tribal representative using a hard copy format as well as an electronic deliverable.
Dates service was provided: 2002 through present

Company or Agency Name: Maxim Technologies, Inc.
Location services were provided: Samples were received from United States Department of Agriculture Forest Service lands which include the New World Project located near Cooke City, Montana. Analysis was performed at our Billings laboratory with no subcontractors.
Contact person: Mike Cormier, P.O. Box 4699, Helena, MT 59624
Customer telephone number: 406-443-5210
Complete description of service: Approximately 10 to 20 water samples collected from the project were delivered to our laboratory for analysis on a monthly or quarterly basis from April through September of each of the past five years. A new arrangement for providing these services was made with Maxim for this year. The samples were analyzed for target analytes similar to the list provided by the State of Montana in this request for proposal. These analytes include trace metals, calcium, magnesium, sodium, alkalinity, nitrate + nitrite, phosphorous, total dissolved solids and total suspended solids using reporting limits that comply with Montana Water Quality Bureau Circular 7 requirements. Data is delivered to the Maxim representative using a hard copy format as well as an electronic deliverable in a user defined format.
Dates service was provided: 1999 through present

Company or Agency Name: Westmoreland Resources, Inc.
Location services were provided: Samples were received from mine areas. Analysis was performed at our Billings laboratory with no subcontractors.
Contact person: Richard Claussen or Darrel Myran, P.O. Box 449, Hardin, MT 59034
Customer telephone number: 406-342-4504
Complete description of service: Water samples collected by Westmoreland representatives were delivered to our laboratory for analysis periodically over the past

three years. The samples are analyzed for target analytes similar to the list provided by the State of Montana in this request for proposal. These analytes include trace metals, calcium, magnesium, sodium, alkalinity, chloride, fluoride, sulfate, nitrate+nitrite, phosphorous, total dissolved solids, and total suspended solids. Cation anion balances are measured as a step in the quality assurance effort and reporting limits used comply with Montana Water Quality Bureau Circular 7 requirements. Data is delivered to the Westmoreland representative using a hard copy format as well as an electronic deliverable in a format defined by Northern.
Dates service was provided: 2001 through present

A description of our work on a major water analysis project cannot be presented here due to the client's request that their use of our services remain confidential. In general terms, we can state that a significant part of our water analysis workload in the past year was directly related to the list of analytes required for MDEQ's project. Hard copy reports were delivered using the format specified by MDEQ in Section 4.2.14 of the RFP with the exception of reporting data to the method detection limit (mdl). Electronic deliverables were provided in a format mutually agreed upon between the client and Northern.

Capacity

Northern maintains records of the number of projects we receive on a monthly basis. Generally, we receive between 150 and 350 individual projects per month for the various types of environmental analysis we provide. These projects may contain as few as one sample or as many as 50 samples. Each project may require as few as one test per sample or as many as 120 tests per sample. Because of this variability, each member of our staff is trained in several areas of the lab so that when work loads peak in a specific area of our work, we can provide additional help from other groups in the lab.

Our laboratory capacity is best demonstrated by the work we performed on related projects in calendar year 2003. During the months of April through October, our laboratory analyzed about 200 samples each month for various subsets of the TMDL parameters. This did not include air, water or soil samples received for other environmental purposes such as landfill monitoring, drinking water evaluation, leaking underground storage tank assessments, site assessment, lead paint assessments, asbestos analysis or workplace exposures (industrial hygiene samples).

Generally, our work for each of these projects was completed within a three week period with some delivery dates as long as six weeks. The variability in our turnaround times was dependent on the extent of the parameter list requested and the complexity of the final report. With a few minor exceptions, holding times were met for short holding time parameters such as ortho-phosphate (48 hours), suspended or dissolved solids (7 days). With few exceptions, pH tests were performed immediately (same day samples arrival at the lab). If a sample holding time is exceeded, the reported sample concentration is noted as such in our written report. Our analysis of samples routinely

met holding times for nutrients (nitrates, ammonia, kjeldahl nitrogen) heavy metals and organic analytes such as volatile petroleum hydrocarbons, extractable petroleum hydrocarbons, volatile purgeable organics and semivolatile organics.

For this project, the MDEQ project managers can expect to routinely receive complete reports in the format required in three to four weeks from the receipt of samples. The electronic deliverable in the STORET format would follow the final report within one week. In the event a report delivery date of four weeks will be exceeded, the MDEQ project manager would be advised beforehand.

These delivery times apply to samples which are analyzed for any combination of analytes listed in the categories *Special Services, Inorganics, Metals, and Sediment Samples* listed in Attachment A1. When we determine our ability to provide adequate service will be impaired due to excessive sample loads, we would advise the MDEQ project manager immediately.

Delivery times of two weeks or less can be expected when samples are submitted for fewer than 10 analytes or for a single method with many analytes. For example, we can routinely provide reports of analysis of water samples for volatile organic compounds by EPA Methods 524.2 or 624 within five to seven working days. Similarly, short lists of metals measured using EPA Method 6010B in sediments or 200.8 in water can be provided in ten working days.

Cost

Our fees are provided in Attachment A1 which is included at the end of tabbed Section 5 of our proposal.

Quality System

Laboratory Quality Assurance Plan

Our laboratory quality system is described in our Quality Assurance Plan which is included in its entirety in the tabbed section so labeled.

Certification

Our laboratory is certified or accredited by the following agencies.

- State of Montana Department of Health and Human Services for drinking water analysis
- American Industrial Hygiene Association for environmental lead projects
- National Voluntary Laboratory Accreditation Program (NVLAP) for bulk asbestos analysis

Certificates to demonstrate these are included herein.

Performance Evaluation Studies

Northern participates routinely in the Water Supply (WS) performance evaluation study as well as the National Institute of Occupational Safety and Health Proficiency Analytical Testing program and NVLAPs' bulk asbestos proficiency test program. We have included the results of the last two WS audits for which we submitted results. Corrective actions reports written for each outlier are provided for the WS91 audit. Corrective action reports were not required by our quality assurance coordinator for the outliers reported in WS85.

Reporting Results

Hardcopy Report and Quality Control Summary

Because of the variety of work we perform, the format of our hard copy reports varies from client to client. We have enclosed several example reports which include the fields of interest to MDEQ. Our laboratory data management system provides the flexibility needed to include in reports the information requested by each of our clients. If Northern is awarded this project, we will work with MDEQ to provide a report format to meet their specific needs.

Several notes of concern, in the RFP, MDEQ requires the evaluation of the method blank to a level equal to <1/2 MDL. The corrective action is to qualify all sample concentrations accordingly. Because of the EPA definition of MDL, we believe evaluating an instrument response or chemical measurement to <1/2MDL is not valid. Typically, when the MDL is used as the reporting limit, we only apply data qualifiers to sample concentrations associated with method blanks that contain analytes at or above the MDL. Northern would be pleased to discuss this data review procedure with MDEQ representatives should we be awarded a contract.

Northern understands and will comply with the report and data retention requirements made in the RFP.

Electronic Data Deliverable (EDD)

An example of a STORET EDD provided by Northern to Tetratech, Inc. in August of 2003 as part of the project described in Section 4.1.1 is enclosed herein. Northern understands the interpretation of the field definitions is important in the process of preparing STORET data. Should we be awarded a contract to perform this work, Northern will discuss MDEQ's specific requirements with regard to STORET data. Should additional fields of data be required by MDEQ, Northern is willing to provide those.

TABLE OF CONTENTS

1.0 PURPOSE

The purpose of this manual is to provide written policies and procedures for testing services provided by Northern Analytical Laboratories, Inc., an analytical services laboratory located in Billings, Montana. These written policies and procedures communicate the standards of performance expected within our organization to all our employees and interested clients. Our quality assurance system addresses personnel, equipment, facilities, testing and supervision. A quality control coordinator has been designated to monitor the program and report discrepancies to the Laboratory Manager. This quality assurance plan serves as a basis for conformance audits by our clients, federal agencies, and certification organizations.

2.0 OBJECTIVES

It is our objective to document the quality of the data generated by our testing services, and thus to maintain a reputation of quality service, including timely, and within budget expectations. We intend to meet these objectives by charging a reasonable fee to our clients and by making a profit for the owners of Northern Analytical Laboratories, Inc.

Specific objectives of our standards of performance are as follows:

- To develop, implement, review, and update laboratory practices and routine methodologies. This will encompass, among other things, analytical procedures, sample preparation, and personnel training.

- To monitor and take corrective action as required, to maintain a performance level consistent with our guidelines, client needs, and/or regulatory agency requirements.

- To utilize personnel who are trained for the tasks assigned and to provide the supervision and expertise to assure that the analysis complies with standard procedures and recognized chemical laboratory techniques.

- To inventory, maintain, and calibrate testing equipment used in our business. To purchase supplies and services that provide us with the ability to maintain our testing objectives.

- To review all laboratory data to assure it meets our quality requirements before results are given to the client.

- To participate in performance evaluation studies, inter-laboratory and other round robin evaluation programs in order to monitor the consistency and level of quality within the chemical laboratory.

3.0 ORGANIZATION

3.1 Laboratory History

Northern Engineering and Testing, Inc. was founded in 1958. In 1987 Northern Engineering and the Denver based firm, Chen and Associates, were acquired by Huntingdon International Holdings (HIH). The two firms were merged in 1988 to form Chen-Northern, Inc. In 1993 HIH consolidated all of their United States holdings into one corporate structure, Huntingdon Engineering and Environmental, Inc. In May, 1995 Huntingdon Engineering and Environmental was purchased by Maxim Technologies headquartered in Dallas, Texas. On August 4, 1999 Northern Analytical Laboratories, Inc. purchased the Billings, Montana chemistry laboratory from Maxim Technologies.

3.2 Operations

The services provided by the chemical laboratory include drinking water, water and wastewater, soil, and solid waste analysis. Air quality, industrial hygiene, asbestos identification, and mining related soils analysis is also performed.

As our clients require testing and/or the analysis of materials outside our areas of expertise, we will employ qualified laboratories or consultants who have demonstrated expertise and qualifications consistent with the quality of service precepts of Northern Analytical Laboratories, Inc.

3.3 Organizational Structure

The responsibilities and authority of the individual positions in the laboratory are described in the following sections. The organizational structure of Northern Analytical Laboratories, Inc. is in diagram form in Figure 3-1.

3.3.1 Laboratory Manager

The laboratory manager is responsible for the overall supervision of laboratory personnel, policies, and procedures. The laboratory manager's responsibilities include:

- Personnel supervision for timeliness, productivity, and performance of appropriate activity. This includes compliance to quality assurance and safety policies.
- Scheduling of testing and services to meet EPA holding times and client expectations in a timely and efficient manner and to meet Northern profit goals.
- Implementation of corrective actions when nonconforming work is identified. This includes assignment of necessary actions to analytical group leaders, quality assurance staff, or project management staff.
- Cost control for supplies, labor, and equipment.

- Review of laboratory capabilities for proper use of equipment and methods, use of equipment to its full potential, and limitations in capabilities of methods and equipment. Approval of use of new methods, techniques and equipment after development of such by the lab staff.
- Review of laboratory quality system to maintain quality policies to the standards required by our accrediting bodies including ISO 17025 criteria, EPA's Drinking Policies for Certification of Drinking Water Laboratories, NIST Handbook 150 and AIHA Laboratory Quality Assurance Program Policies.
- Management support to maintain employee moral, client support, and client and employee confidence in management.
- Client communications, including timely response to client requests, timely reporting of laboratory results, professional communication in both written and verbal form.
- Price/fee determinations, including quotations of fees to clients, fair and equal fee administration, and fee determination based on fair profit expectations.

3.3.2 Quality Assurance Coordinator (QAC)

The QAC is responsible to the laboratory manager for the oversight and implementation of the quality assurance program as outlined in this manual. The QAC's duties include:

- Daily review of work performed by the laboratory analysts
- Identifying and responding to QA needs, resolving problems, initiating corrective actions, and answering requests for guidance or assistance
- Overseeing proficiency testing for laboratory accreditations and coordinating on-site inspections
- Perform internal audits as deemed necessary by the QAC or the laboratory manager and submit a written report to the laboratory manager
- Establish quality control acceptance criteria through statistical manipulation of quality control data or as required by the analytical method
- Provide oversight and maintenance of the Standard Operating Procedures

3.3.3 Group Leaders

Group leaders are assigned as technical and scheduling experts for each group of similar methods, instruments or analyte types. Typically, a group leader is assigned to each of the following groups.

Metals analysis

Inorganics analysis

Organics analysis

The authorities and responsibilities of the group leader include but are not limited to:

- Scheduling of tests to achieve valid analyses within appropriate holding times
- Review analyses performed by members of the group for appropriateness, calculation verification, compliance to quality assurance program
- Scheduling of analysts to achieve productive use of all staff members
- Develop and implement new techniques, methods or instruments for approval by the lab manager for use by the lab staff

3.3.4 Chemists

Chemists are assigned sample preparation and analysis duties based on their education, experience and training. Typically, staff members assigned as chemists have bachelors degrees in chemistry, biology or other related scientific field. While not responsible for supervising others, they are assigned to train coworkers.

3.3.5 Laboratory Technicians

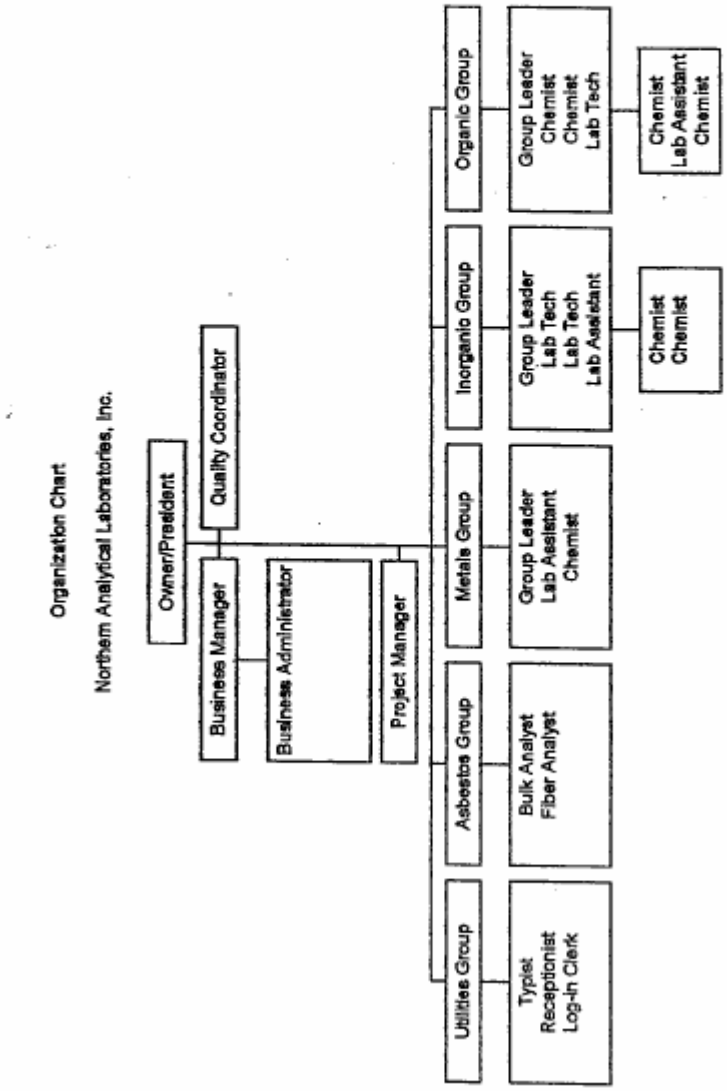
Staff assigned as laboratory technicians are assigned sample preparation and analysis duties based on their education, experience and training. Minimum education requirements vary but personnel must have education or experience that provides them with adequate knowledge to perform quantitative analysis under the supervision of a chemist.

3.3.6 Utility Staff

This title includes staff members assigned as laboratory assistants, log-in clerks and typists. A high school education is required for this position. Personnel are assigned work at the direction of a group leader or manager.

Figure 3-1

Organizational Structure



4.0 FACILITIES

The laboratory has a total of 5000 square feet of floor space assigned to laboratory service. An additional area of 1500 square feet is used for support staff and functions such as lunchroom and mail processing. Figure 4-1 shows the layout of the laboratory, including labeled areas for specific laboratory analysis. A floor plan is not provided for the support space.

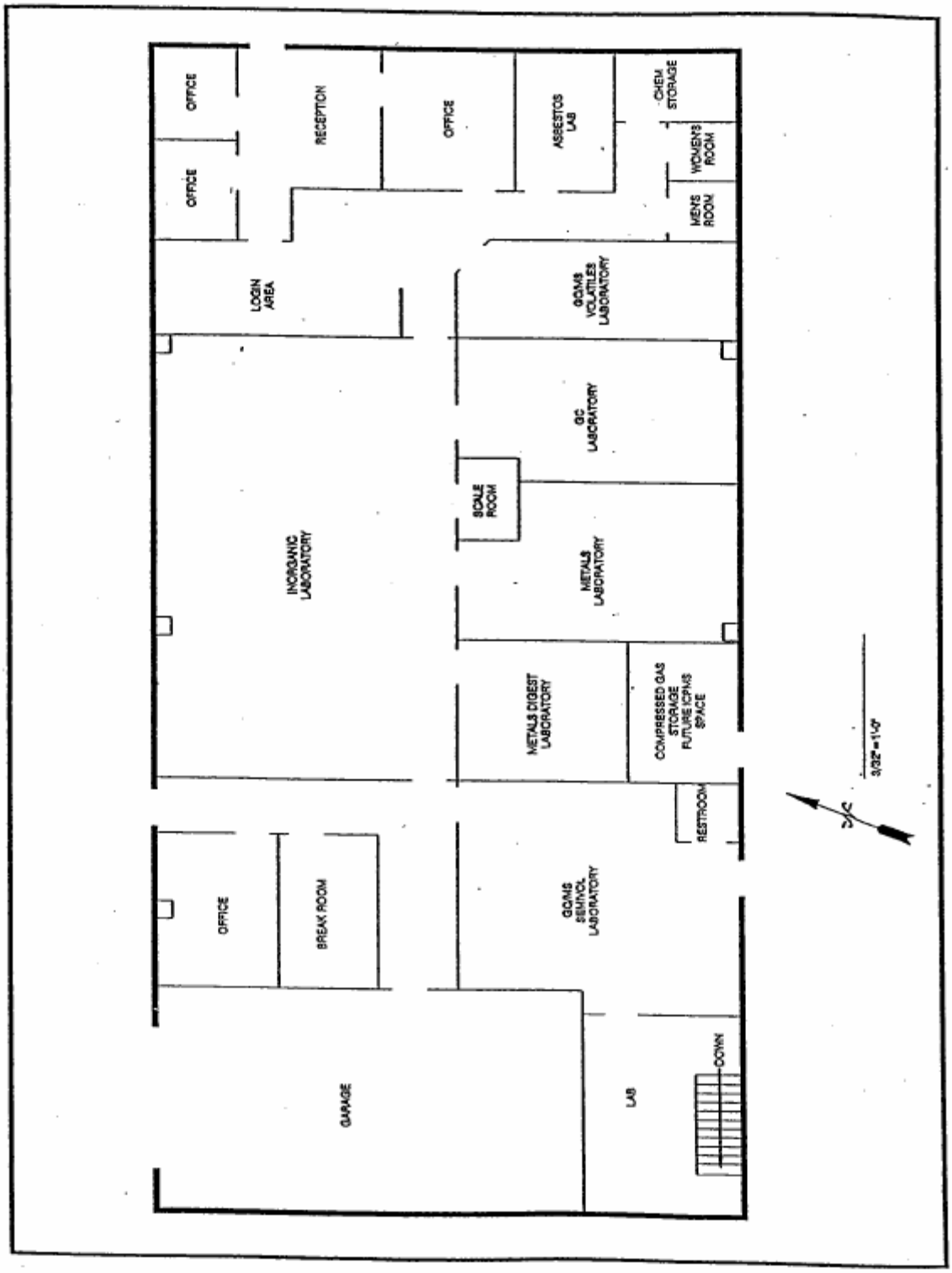
The air quality of the laboratory is controlled by the use of ventilation. The laboratory is equipped with three forced air heating systems. Air conditioning is also provided by three central units. In addition a make up air unit with heating and cooling capabilities can be turned on when additional air flow is needed. Seven fume hoods having face velocities of 80-100 feet per minute provide exhaust ventilation of noxious fumes to maintain air quality. There are also canopy fume hoods for general elimination of hazardous and noxious vapors from the Atomic Absorption and Inductively Coupled Plasma Units.

Sample refrigeration is provided by four large commercial refrigeration units and one small refrigerator. In addition four refrigerator/freezers provide storage of standards and organic extracts. The temperature of all coolers is monitored daily and kept within a range of 2 to 6 degrees centigrade.

Deionized water is provided by a Millipore reverse osmosis system. Type II reagent grade water is produced by passing tap water through the reverse osmosis system and Barnstead polishing cartridges. Type I water is produced by passing the Type II water through a Millipore Super Q four bed system. Water used for organic analysis is prepared by passing Type II water through a charcoal bed or is obtained from a private well which has been demonstrated to be free of the analytes for which we test.

Figure 4-1

Laboratory Floor Plan



5.0 RECORDKEEPING, CHAIN OF CUSTODY, DOCUMENT CONTROL

Records are maintained in the chemical laboratory which establish the chain of custody, identify the sample, request the prescribed analysis, document the analysis, and document the report. Records are also maintained on personnel qualifications, equipment status, and quality control reports.

5.1 Chain of Custody

Upon receipt of samples in the laboratory, they are forwarded to the laboratory manager's representative in the sample log-in area. The condition of the samples upon receipt at the laboratory is recorded on the Sample Receipt Checklist (Figure 5-1). A copy of this checklist is included with the final report. For environmental samples, the temperature of the shipping container is recorded. The shipping container (ie: cooler, box, mailer, etc) is unpacked and the identifications on the samples compared against the chain of custody. The chain of custody is signed by the manager's representative. The date and time of receipt are recorded. If delivered by common carrier, the carriers name is recorded. Any identity deviations are noted on the chain of custody. Also noted are samples listed but not received or samples received that are not listed.

The pH of the preserved environmental samples is checked with wide range pH paper and additional preservative added if necessary. The pH of VOA vials, DRO, EPH, 418.1, and Oil and Grease samples are checked at the time of analysis.

For air samples collected on filters or sorbent tubes, the condition of each sample is examined. Factors that affect validity include cassette or tube condition, presence of the sealing plugs, unreadable identifications, and contaminated outside containers. Inspections for punctures, tears, wetness, particulate loading or other factors that may affect sample validity are made by the analyst. Notes of these factors shall be made on the sample analysis sheet or Sample Receipt Checklist and the written report to the client.

For asbestos identification in bulk samples each sample shall be examined at the time of log-in for factors that affects its validity. Notes of these factors shall be made on the Sample Receipt Checklist, and include integrity of the sample container and contamination on the outside of the samples. Sample acceptance/rejection shall be determined by the analyst based on these factors and sample size or wetness which might have effected discreet layer sizes. The analyst shall complete the

Sample Receipt Checklist item #9 or the "Comments" section to note if the sample is inappropriate for analysis.

Clients are contacted by phone or facsimile message when it is determined that the condition of their samples upon receipt jeopardizes the validity of the samples.

A three part chain of custody is used (Figure 5-2). The original is kept in the laboratory with the sample work order. The pink carbon is kept by the client, the yellow carbon is sent back to the client as an acknowledgement of sample receipt. A copy of the chain of custody is included with the final report to the client.

5.2 Sample Log-in

The project information accompanying the samples is recorded on a sample log sheet and is assigned an order number. The order laboratory number is recorded on the chain of custody and written on every sample container along with a fraction code. The fraction code is a letter or letter(s) and number to designate the type of sample, the container and preservative used for that aliquot of sample. A list of fraction codes is posted in log in section of the laboratory.

Before distribution of the samples to the laboratory, the laboratory numbers written on the sample bottles are checked against the chain of custody and sample log sheet by a second person. The sample identification information is then entered into the laboratory information management system (LIMS): client identification; project number; sample identity; date received; date and time collected; and samplers name. The requested tests are then assigned to that sample.

A work order is then printed which lists the entered information listed above, and the tests assigned to each sample. The work order copy is posted in the laboratory with any packing slips, purchase orders, chain of custodies or letters of transmittal that accompanied the sample upon delivery. The requested tests and holding time expiration (if applicable) are then recorded on the appropriate tracking charts. Charts are located in the inorganic, metals, organic, and GC/MS laboratories. Samples are stored in the laboratory under conditions specified by the method or the SOP until the test has been performed in a satisfactory manner. The samples are then stored for a minimum of thirty days after the report has been sent to the client in a sample archive area which is maintained at room temperature and indoor environmental conditions. The sample is then either disposed in

accordance with environmental regulations for solid wastes or returned to the client. Samples will be retained for longer than thirty days if requested by the client in writing.

5.3 Document Control

In order to maintain consistency in our work, our laboratory management provides for the control of all documents that are recognized as having a significant effect on our work. The following document types are controlled for use by our laboratory quality policy. Details of the policies are described herein.

Quality System documentation (5.3.1)
Test methods (5.3.2)
Standard operating procedures (5.3.3)
Regulations which affect analysis (5.3.4)
Equipment manuals (5.3.5)
Software (5.3.6)
Laboratory analysis (5.3.7)
Reports of analysis (5.3.8)
Test requests from clients (5.3.9)
Contracts with clients (5.3.10)
Supporting QA documents (5.3.11)

5.3.1 Document Control for Quality System Documents

Quality system documents are defined as documents that define procedures and policies used to ensure the generation of analytical results of acceptable quality. Examples of quality system documents are this manual, SOPs, precision and accuracy critera, and memos that institute new, or clarify existing quality system guidelines. This QA manual and SOPs are controlled documents for which distribution lists are kept. When other quality system documents are distributed the document is dated, initialed, and given an effective date. The analyst intials are obtained on the QACs copy of the document indicating the document was received and, where applicable, that old copies of the document are to be discarded.

5.3.2 Document Control for Test Methods

Test methods used by this laboratory are taken from published sources which are directly related to the client's need for testing. Sources such as the American Society for Testing and Materials (ASTM), the United States Code of Federal Regulations (CFR), the

Environmental Protection Agency (EPA), the National Institute of Occupational Safety and Health (NIOSH) and others are used for test methods. Written copies of methods from these sources are maintained by the quality assurance coordinator. When tests are performed by the laboratory, our standard operating procedures (SOP) are used. If an SOP is not available, the analyst obtains a copy of the reference method from the quality assurance coordinator. When writing SOPs or performing tests for which an SOP is not a available, the analyst is referred to Table 11-1 of this manual. This table directs the analyst to the appropriate method to use based on the type of sample to be analyzed. Sample types include drinking water, wastewater and solid waste.

5.3.3 Document Control of Standard Operating Procedures (SOPs)

Standard operating procedures are written for commonly used methods performed by our laboratory. These are written and revised in accordance with our SOP for writing and revising SOPs. SOPs are distributed by the QAC. A central file copy of original current revisions of SOPs is maintained by the QAC and kept in the QAC office. Outdated SOP revisions are maintained by the QAC in a separate file. Three controlled laboratory copies of the SOP manuals are maintained by the QAC and are available to laboratory personnel. A SOP distribution list is maintained by the QAC. Controlled SOP copies are distributed to the three lab copies and uncontrolled copies are distributed to the appropriate lab analysts. The SOP table of contents, maintained by the QAC, lists all current revisions of the SOPs. Each SOP is assigned a revision number that denotes the number of revisions of the SOP and the month and year of the revision. For example, the second revision of a SOP completed in August of 2001 would be assigned the revision number 02-0801.

5.3.4 Document Control for Regulations

Regulations which effect the production of our test results are tracked by the laboratory manager. On an annual basis, review of the following regulations are made to determine if our laboratory methods are in compliance with current state or federal regulations.

40 CFR Part 136 for wastewater analysis

29 CFR Part 1910.1000 Table Z for breathing zone contaminants

40 CFR Part 141 for drinking water

40 CFR Part 261 for solid waste analysis

5.3.5 Document Control for Equipment Manuals

Operators manuals are obtained (when published by the manufacturer) with all equipment purchased for use in the laboratory. These manuals are stored in two ways. For key instrumentation like gas chromatographs, inductively coupled plasma spectrometers, microscopes, block digestors and other devices; the operators manuals are located in the laboratory with the instrument. These are typically dated when received with the instrument and are available for use by the operator at all times. For other instruments and machines such as processing equipment, an alphabetical file of operations manuals is kept by the file clerk. This is located in the reception area and each analyst is advised of its location. Analysts are advised to obtain the manual from the file when they need to refer to it then return it to the file clerk for filing when they are finished with the manual.

5.3.6 Document Control of Software

Software used in our laboratory typically serves one or more of the following four operational functions. Examples of each type are listed with the functions. A complete list of software with version numbers is provided in our equipment list.

Word processing-Microsoft WORD or Microsoft WORKS

Calculation-Microsoft EXCEL, Microsoft WORKS or Lotus 1-2-3

Instrument operation-Hewlett Packard Chemstation, Perkin Elmer Elan, Astoria Pacific FASTPAC, Thermo Jarrell Ash ThermoSpec.

Data management-Visual LabPro by Prism, Inc.

The following steps are taken to provide for the integrity of data produced by or stored by software in this laboratory.

- Electronic spreadsheets are prepared for use then checked using several scenarios of entries to check mathematical correctness and to verify the calculated results represent the true test results. The applicable cells are then locked by the electronic spreadsheet and password protected by the quality assurance coordinator. Changes in the spreadsheets are made only by the quality assurance coordinator and then are rechecked using this process. The approved spreadsheets are dated and initialed by the quality assurance coordinator.
- Vendor software such as Hewlett Packard's Chemstation software or Perkin Elmer's Elan software is used without modification by the laboratory.

- Calculations made in LabPro or Visual LabPro are prepared by an analyst and checked by the group leader. A record of their verification is stored in the raw data log books. Changes to these calculations require a second review and approval.

5.3.7 Document Control of Laboratory Analysis

Laboratory analysis is documented in one of six ways.

1. The data is written in a bound paginated laboratory notebook.

   Laboratory notebooks in use in the laboratory are bound and paginated either by the manufacturer or are bound and paginated by our utility staff and sealed for use by the quality assurance coordinator. Record sheets in method specific formats for data record keeping are designed and approved for use by the QAC or lab management. These record sheets are paginated and bound into sets of one hundred pages. The QAC applies a custody seal prior to distribution for use in the laboratory.
2. Instrument printouts are used for GC, GC/MS, ICP, ICP/MS and auto analyzer data. Bound and paginated run logs are maintained for these instruments where applicable. Current auto analyzer instrument printouts are stored in a labeled three ring binder. When the binder has been filled the printouts are removed, page number stamped, bound, and a custody seal applied to the bound notebook. GC, GCMS, ICP and ICPMS instrument printouts attached to the work order or stored in labeled file boxes.
3. Raw data is recorded directly in the LIMS as it is generated. The LIMS then calculates and posts the results. An analytical report of the raw data and final calculated result is then printed. Current data is stored in a labeled three ring binder. When the binder as been filled the printouts are removed, page number stamped, bound and a custody seal applied to the bound notebook.
4. Raw data from laboratory notebooks and/or instrument printouts is entered into laboratory approved spreadsheets for calculation of final results and posting of the spreadsheet results to the LIMS. The spreadsheets are printed and attached to the work order or attached to the associated raw data.
5. Fiber count data is entered into a electronic spreadsheet and printed. The individual spreadsheets are then bound and page numbered in sets of 100 pages. A custody seal is applied to the bound data.
6. Bulk asbestos data is recorded on previously numbered recordsheets. The completed recordsheets are then bound in sets of 100 pages and a custody seal applied to the bound data.

Notebook pages, record sheets and instrument printouts are initialed and dated by the analyst. Manual calculations are checked by a second analyst. Data entries into electronic spreadsheets are checked by a second analyst.

Upon completion of the analysis, the test results are recorded on the work order or the instrument printouts or spreadsheets are attached to the work order. The data is then entered in the LIMS. GC, GC/MS, and auto analyzer data is directly downloaded into LIMS from the instrument. Raw data that is recorded into and calculated by LIMS is posted. All other results are entered into LIMS by data entry personnel from instrument printouts or the laboratory notebook.

Laboratory analysis data are stored in our file archive by data or instrument type in sequential order by date for five years, ten years for environmental lead data, after the data is produced unless other arrangements are made by the client. The file archive is reviewed on a semiannual basis and records are disposed at the direction of the laboratory manager. Raw data records are disposed directly to the solid waste dumpster for disposal at the local sanitary landfill.

While electronic records are kept for gas chromatography analyses, these records are not used by the laboratory as the source of the data which was reported to the client. Use of these electronic records is only allowed at the direction of the lab management. Then, review of the storage conditions of the records is made by the manager, quality assurance coordinator and the analyst to verify that subsequent analytical determinations made from the data are appropriate for client use.

5.3.8 Document Control of Reports of Analysis

Upon completion of all requested analysis, the data produced by the laboratory is summarized in report form by the LIMS or by a word processor. The data on the printed report is compared to the instrument data, the manual entries made on the work order or the record sheets. Discrepancies are resolved by the reviewer by obtaining the instrument log and raw data and identifying the valid test result. Any required edits are noted and the edits made in the LIMS or in the word processed document by word processing personnel. The edited report is then reviewed and signed by the laboratory manager or representative. As a result of this process, each report is reviewed by two different authorized reviewers or, if the

report consists of routine analytes and samples it may be reviewed twice by the same reviewer. For bulk asbestos analysis and fiber counts by NIOSH Method 7400, the analyst is one of the reviewers. For bulk asbestos reports, only signatories approved by NVLAP are allowed to routinely review and sign reports.

The laboratory report produced by this laboratory consists of a case narrative, pages containing sample results and quality control sample results and applicable attachments such as sample receipt checklists and chain of custodies. The case narrative contains the following information.

identity of the client that is responsible for the samples
client job number
date the report is prepared
source of the samples by project name or number
signature by an approved signatory with typed name and title
total number of pages in the report
attachments
identity of others who receive copies of the report

The narrative will identify the source of the methods used for our testing, define qualifies which would limit the use of the data and describe the contents of the report. For samples applicable to our AIHA accreditation, the presence of field blanks will be noted with a description as to how the blank results were applied to the sample results. Should the report be revised, the revision date will be clearly noted in the top right corner of the case narrative and will contain a description of the changes made to the report.

The results of our analysis will follow on subsequent, numbered report pages. Reports for samples relating to our NVLAP and AIHA accreditations will be numbered using the page number and total number of pages on each page. The project data provided for each sample will consist of sample description, laboratory number, matrix, date collected and sample collector's identity. Analytical results will be documented by analyte name, measured value, statistical variation of the measured value if applicable, units, method code and date analyzed. For industrial hygiene samples, the limit of quantitation will be provided with the results or on the case narrative. Data qualifiers will be provided through the use of footnotes

or lettered designations whose definitions are spelled out in the case narrative. Results of quality control tests may be provided, their inclusion will be based on client needs.

When multiple report copies are requested or when a copy of a previously published report is requested by a client, only paper copies of final reports are reproduced for client use. If a paper report cannot be located, the report preparation and review process is repeated as described previously to verify all data on the final report. The report is reviewed and signed as if it were produced for the first time. Electronically stored final reports are not reproduced for client use without undergoing the complete review process described above.

The original signed report is mailed to the client with copies of attachments which usually consist of the chain of custody and the sample receipt checklist. A copy of the report, the work order, and all accompanying attachments are placed in the project file. Project files are numbered using a two digit number signifying the year the client first requested work to be performed by the lab. A three digit number follows which is assigned consecutively throughout the year by the utility staff. An additional two digit suffix may be applied when a particular client has two addresses for receipt of reports or multiple projects which may be more readily filed separately. Current files are stored in file cabinets in the file room near the reception area. Due to limited space, aged files are stored in file boxes by client number in the file archive area which is located inside the confines of our laboratory building. Each report is retained for ten years, unless otherwise required by regulation or mutual agreement with our client. The file archive is reviewed semiannually and aged records are disposed directly to the sanitary landfill to protect the client information contained therein. All disposal of final reports is performed at the direction of the laboratory manager.

5.3.9 Documentation of Test Requests and Client Communications

Requests for testing should be received in writing from the authorized representative of the entity paying for the laboratory services. Typically, test requests are made on chain of custody documents, letters of transmittal, purchase orders or in written contracts. These are stored with the laboratory data in the client file for the period of storage specified for the raw data. Verbal test requests or changes in test requests made verbally by authorized client representatives are recorded on the chain of custody or the work order by the person receiving the request from the client. The request is documented in writing with the name of the client representative, the initials of our employee receiving the request and the date the

request was made. Efforts by our staff will be made to substantiate the validity of the request if the request is made by someone other than the sample collection agent or the person to whom the report is to be directed.

Other communication from clients which relate to the performance of the tests will be recorded with date and initials on the work order. Complaints regarding data or other aspects of the testing will be recorded and placed in the file with the work order and report. The laboratory manager will be notified of the complaint and the resolution of the problem. A file of customer complaints will be kept in the manager's possession in order that trends and frequency of complaints can be evaluated.

5.3.10 Document Control of Contracts

Contracts made with our clients are kept in a central file in the business office. The applicable scope of work, accompanying quality assurance plan or test request is provided to the laboratory at the time of sample log-in. References to the contract are made in the laboratory report if appropriate and on the final invoice. Contracts are disposed after five years from the date the contract has been satisfied. When a contract has not been formally entered into with a particular client, a statement of understanding is delivered to the client upon receipt of samples. This statement is mailed with the sample receipt checklist and the chain of custody if the sample is delivered by courier. When samples are hand delivered, a copy of the statement is given to the person delivering the samples.

5.3.11 Supporting Quality Assurance Documentation

Additional documentation is maintained to insure that this laboratory meets overall quality standards.

1. Personnel qualifications - Employee resumes are maintained on file as well as training files for each employee.
2. Equipment operation and maintenance – A list of approved operators is maintained for each instrument used to produce analytical results. Maintenance logs are kept for each major analytical instrument.
3. Corrective action reports and analytical non-conformance reports - A corrective action report system is maintained by the QAC.

The documentation maintained by this laboratory is extensive and not limited to that mentioned above.

6.0 QUALITY CONTROL POLICIES

Policies which are implemented by the chemical laboratory to achieve and support the quality objectives are listed in this section. A flow diagram (Figure 6-1), indicates the quality control routine used by this laboratory. This flow diagram governs the actions of the chemists and technicians as they analyze samples for any parameter.

To verify, control, and demonstrate capability as an analytical laboratory, Northern Analytical Laboratories, Inc. subscribes to and participates in the following quality audit programs (See section 15.0):

- Water Supply Performance Evaluation (WS) - Semiannually
- AIHA - PAT program - Quarterly
- AIHA - ELPAT program - Quarterly
- NIST - Asbestos Identification audit - Semiannually

6.1 Documentation / Data Handling / Data Validation

Many of our documentation and data handling policies have already been discussed in Section 5.

Complete and current analytical methods and instrument operating instructions are made available to laboratory personnel. This includes standard operating procedures written specifically for our equipment and methods of analysis.

Administrative and technical review of laboratory reports and records to assure validity and uniformity is provided by the QAC, the analyst generating the data, and the laboratory manager.

Raw data such as tare weights, titration volumes, absorbencies, peak heights, etc. are recorded in the laboratory notebook or entered directly into the LIMS at the time it is generated. Under no circumstances shall data be recorded on a separate sheet of paper for later entry into the LIMS or lab notebooks. Dates, the technician's initials, and method code are recorded in the laboratory notebooks, instrument printouts, and LIMS reports. Notes of unusual circumstances or special sample treatments are to be recorded.

Raw data shall be converted to concentration units by using the calculations given in the appropriate method. Deviations from this are recorded. Data necessary to calculate and verify the data shall be recorded. This includes normalities, dilutions, spiked concentrations, expected spike and control sample results, and percent recoveries. Any data generated is to be calculated. Calculations must be checked by a second analyst or by computer calculation and this check noted along with the analysts initials and date.

6.2 Calibration

Analytical instruments are calibrated at regular intervals as recommended by the manufacturer and as required by the method. Calibration of all equipment used, and documentation of the calibration, will be performed by the analysts or by an independent calibration firm. Refer to the appropriate standard operating procedure or method for specific step by step instructions. The calibration documentation is kept on file in the chemical laboratory.

Analytical standard preparations are recorded in a standard preparation log book and each standard assigned a unique identifying number. Standard solutions are labeled with the standard prep number, date prepared, date expires, concentration and analyst. The standard number is referenced in the laboratory notebooks so that all standards may be traced back to their original source. Analytical standards are traceable to a primary standard as defined by the American Chemical Society and/or to the National Institute of Standards and Technology (NIST). Certificates of analysis received with purchased standards are placed in a central file maintained by the laboratory file clerk.

Calibrations consist of a minimum of three standards and a blank. The analyst should be aware that some analytical methods require calibration with more than three standards or do not require a blank standard in the calibration. Method requirements supersede this document. The calibration is verified by the analysis of a calibration check standard. Where allowable, it is advisable to prepare the check standard from a source separate from the calibration standards. The analyst is advised to refer to the method or standard operating procedure for calibration verification standard source requirements. The calibration is verified by the analysis of the check standard at a minimum of every twenty samples. The analyst is advised to refer to the method or standard operating procedure, as some analytical methods require the check standard to be analyzed more often. Method requirements supersede this QA manual. When sample concentrations exceed the calibrated range or linear range of the instrument, the sample shall be diluted and reanalyzed.

Instruments and anciliary equipment, such as microscopes, analytical balances, pH meters and conductivity meters, are calibrated, or the calibration checked, according to the manufacturers instructions or the appropriate standard operating procedures.

6.3 Analytical Quality Control Requirements

This section will present the general quality control policies used by the laboratory to evaluate the data produced by the laboratory. Each method and/or standard operating procedure specifies the type and frequency of quality controls to be performed. The method and standard operating procedure supersedes this document as to the quality control requirements. The quality control acceptance criteria for accuracy, precision, and surrogate recovery is given in the tables at the end of this section.

- Blanks - System contamination introduced by reagents, glassware, etc. is monitored by the analysis of a reagent blank. At least one reagent blank is run with every batch of up to twenty samples to be analyzed. The reagent blank is taken through the entire analytical process. A calibration blank shall be analyzed at the beginning of each analytical run and at a minimum of every twenty samples thereafter. Detection of an analyte in a blank is to be evaluated and corrective action taken as necessary. Refer to the appropriate method, or standard operating procedure, for blank acceptance criteria.

- Matrix spike - Matrix spikes are used to access accuracy and evaluate sample matrix interferences. A matrix spike is performed on ten percent of samples analyzed. The matrix spike is taken through the entire analytical process. When applicable, bench spikes (post digestion) may be performed. The matrix spike acceptance criteria is generated using data produced in our laboratory or specified by the method. The matrix spike recovery acceptance limits are given in the Accuracy and Precision Report at the end of this section. Recoveries outside of these limits are evaluated and corrective action taken, or the data qualified, as necessary. The matrix spike recovery is calculated as follows:

  $$[(SSR-SR)/SA] \times 100$$

  Where: SSR = Spiked sample result
  SR = Sample result
  SA = Spike added

- Duplicates / Matrix spike duplicates - Duplicates or matrix spike duplicates (MSD) are used to assess precision. A duplicate or MSD is performed on ten percent of the samples

analyzed. These are taken through the entire analytical process. The acceptance criteria for precision is up to twenty percent relative percent difference (RPD) for samples with concentrations equal to or greater than five times the practical quantitation limit (PQL).

The RPD is calculated as follows:

[(S-D)/((S+D)/2)] X 100

Where: S = Sample concentration

D = Duplicate concentration

The allowable range of duplication for samples with concentrations less than, or equal to, five times the PQL is one times the PQL. For example, the PQL of nitrate is 0.05 mg/l, therefore the acceptable range of duplication for samples with a concentration of < or = 0.25 mg/l is 0.05 mg/l. The duplication acceptance limits are given in the Accuracy and Precision Report at the end of this section. Recoveries outside of these acceptance limits are evaluated and corrective action taken as necessary.

- Laboratory Control Samples - A laboratory control sample (LCS), also known as a laboratory fortified blank (LFB) or blank spike, is prepared in the laboratory. Reagent water is spiked with a known amount of analyte and then taken through the entire analytical process. A LCS or LFB is used to assess the accuracy of the method without matrix interferences. A LCS should be analyzed at a minimum of once per analytical batch and at an overall rate of five percent. LCS acceptance limits are given in the Accuracy and Precision Report at the end of this section. Other limits may be specified in the method or may be calculated using data produced in our laboratory. Recoveries outside the acceptance limits are evaluated and corrective action taken as necessary.

- Quality Control Check Sample - A QC check sample is a certified control purchased from an outside source and is used as an independent check of our analytical procedures and standards. The frequency of use varies per method from once per batch to once per quarter. The QC check sample acceptance limits are provided by the QC manufacturer. Recoveries outside those acceptance limits shall be evaluated and corrective action taken as necessary.

- Surrogate Spikes - System performance and matrix interferences are evaluated by the addition of a surrogate to samples evaluated by GC and GC/MS. The surrogate is added prior to extraction or purging. Surrogate recovery acceptance limits are calculated using

data generated by this laboratory or are specified by the method and are given in the Accuracy and Precision Report. Recoveries outside these limits are evaluated and corrective action taken as necessary.

6.4 Corrective Action

When a quality control indicator or other aspect of our work does not meet the requirements of this qap, corrective action is taken. Two types of corrective action reports are routinely used by this laboratory; the Analytical Non-Conformance Report (Figure 6-2) and a Corrective Action Report (Figure 6-3). Either may be initiated by the QAC, lab manager, or the analysts. The QAC maintains a central log of these reports.

The nonconformance report is used when a batch of samples analyzed using a particular method contains quality control sample results that do not comply with our published limits or holding times have been exceeded. The nonconformance report includes the corrective action to be made by the analyst or report writer. These are typically completed by the analyst, reviewed by the qac and provided to the lab manager. The corrective actions may include re-calibration and reanalysis, re-preparation and analysis or application of qualifiers to the written report to the client. If data has been reported to the client for non-compliant batches and the noncompliance has an effect on the data quality, the lab manager will contact the client in writing regarding the validity of the data.

The corrective action report is used when a system routinely fails to support a quality product. That is, some aspect of our service fails to meet the client needs or the requirements of this qap. The corrective action report is initiated by manager, qac or analyst. It will contain a description of the shortcoming, suggested corrective measures and a due date. The report will be provided to the manager and affected staff. The staff members assigned to correct the system make necessary changes to the process or system, describe the steps taken in the corrective action report and return the report to the manager who approves or takes other corrective measures. The completed report is returned to the qac to be logged as a completed action. . If data has been reported to the client for samples analyzed in a system that needs corrective measures and the noncompliance has an effect on the data quality, the lab manager will contact the client in writing regarding the validity of the data.

A review of the log of non conformances and corrective actions is made in the quarterly review (see 6.5 below) in conjunction with the customer complaints file to identify repeating problems in the

quality system. Then, the lab manager, quality coordinator and other appropriate staff review the problem to identify the root cause of the recurring error. The review should consist of

the nature of the problem (analytical, clerical, verbal communication, etc.)
the method Northern uses for the action or service and any applicable SOPs
the recipient or users interpretation or actions relating to the service or action provided
the staff members involved in the service or action that is identified as problematic
quality assurance plan policies relating to the problem

This process is then documented in a corrective action report and the corrective action is implemented by the appropriate staff members with the lab manager's oversight. An entry into the lab manager's time file is made to remind the manager to ask foran internal audit by the qac at some appropriate time interval if follow up is necessary.

6.5 Quality Reviews

An internal audit of the laboratory's quality assurance system will be conducted on an annual basis. This review will be conducted by the QAC. A written report will be made to the laboratory manager of the deficiencies found. Audits will be conducted using on-site audit checklists obtained from the accrediting body applicable to the service aspect being audited. For example, the following audit checklist sources will be used:

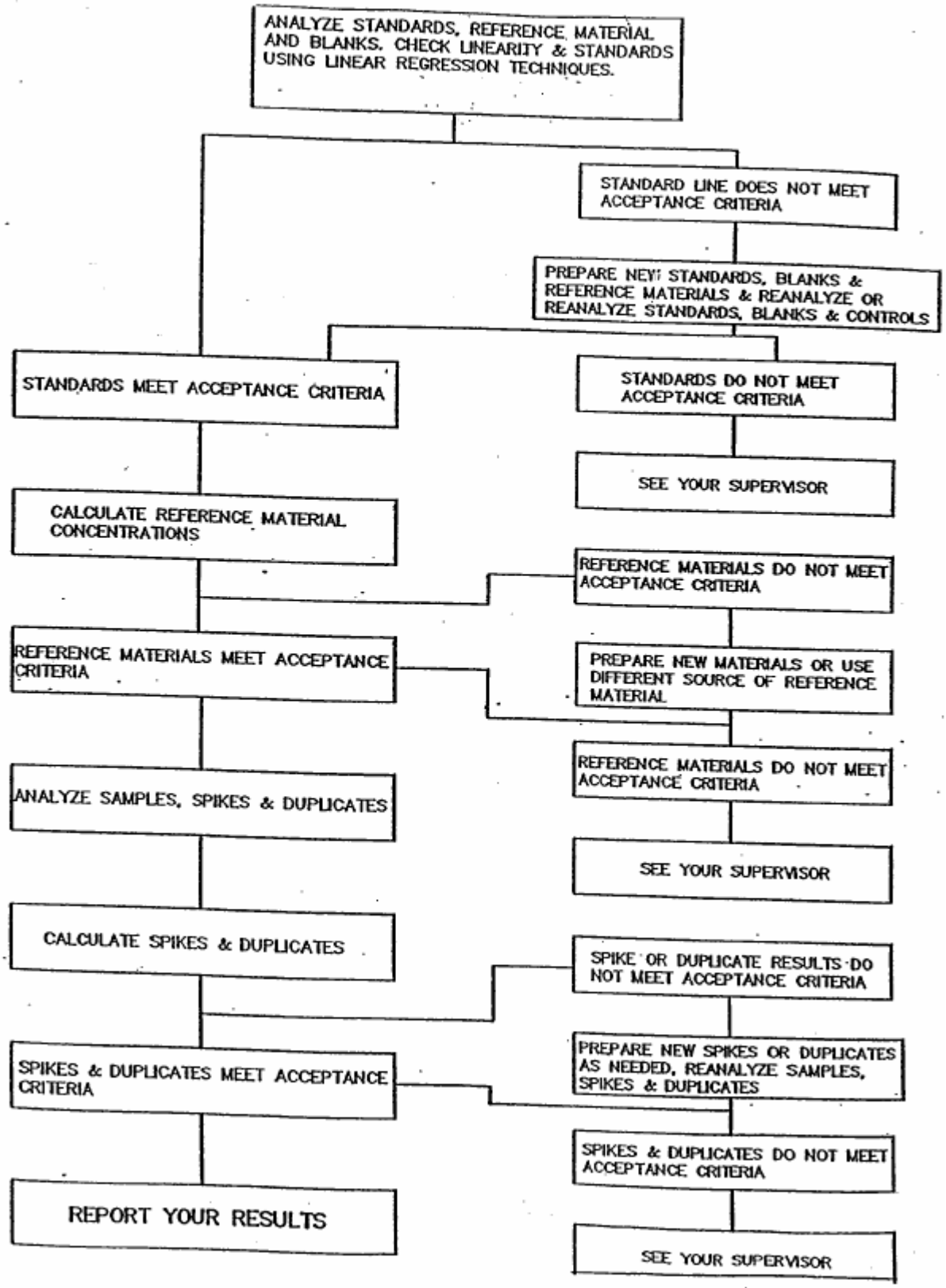
Drinking Water—Montana Department of Public Health and Human Services
Industrial Hygiene and Lead---- American Industrial Hygiene Association
Asbestos Bulk----National Voluntary Lab Accreditation Program

Internal audits of specific areas of concern or specific methods will be conducted by the QAC as directed by the laboratory manager or as deemed necessary by the QAC. A written report of the findings will be made to the laboratory manager. Written quality assurance reviews of specific projects are provided to our clients when requested.

A quarterly report of QC activities is made by the QAC to the lab manager.

Figure 6-1

QUALITY CONTROL ROUTINE



7.0 MAINTENANCE OF INSTRUMENTS AND EQUIPMENT

Maintenance log books are maintained for all major laboratory instrumentation. The log book may consist of a numbered and paginated book or consecutively dated loose leaf binder. The book shall identify the manufacturer and model number of the instrument and if several of the same type are present in the lab, the unit serial number. Entries into the log will be in ink with date and initial of the person making the entry. A description of the reason for the maintenance (preventative or corrective action) will be provided as well as the actions taken to make the repairs. Purchase orders, packing list or parts descriptions shall be included in the log by attachment or reference. If maintenance is performed by the manufacturer's representative or contracted service, the date and identity of the service provider will be included.

Following is a listing of some of the preventive maintenance procedures performed on our major instrumentation.

GC/MS

- Clean source – every six months or as needed
- Replace column – every six months or as needed
- Replace trap (volatiles) – every six months or as needed
- Replace injection port liner, clean port, replace septa, cut column (semivolatiles) - daily, when in use
- Bake trap (volatiles) - after each sample

Inductively Coupled Plasma Emission Spectrophotometer (ICP)`

- Check air flow – daily
- Profile – daily
- Replace sample tubing – daily
- Clean nebulizer – daily
- Clean air filters – monthly
- Fill water circulator – as needed
- Replace torch - as needed

Inductively Coupled Plasma Emission Mass Spectrometry (ICPMS)

- Auto optimize - daily
- Clean nebulizer – as needed
- Replace torch – as needed
- Replace sample tubing – every 8 hours
- Replace waste and A/S tubing – as needed
- Fill coolant – as needed
- Replace pump oil – as needed
- Clean filters – monthly
- Clean/replace cones – as needed
- Clean/replace lens – as needed

Atomic Absorption Spectrophotometer

- Clean air inlet filters - monthly

Auto Analyzer (Alpkem Flow Solution)

- Replace tubing - as needed
- Clean cartridges - monthly
- Wipe surfaces - weekly

Gas Chromatograph (direct injection)

- Replace septum and liner - weekly or as needed
- Cut column - as needed
- Clean FID - every six months or as needed
- Send ECD in for cleaning – annually or as needed
- Change oxygen and moisture traps (on gas lines) - every 2 years or as needed

Gas Chromatograph (volatiles)

- Change trap - every 6 months or as needed
- Clean FID - every 6 months or as needed
- Clean PID - monthly or as needed

8.0 CHEMICAL AND REAGENT QUALITY

The control of incoming materials, chemicals, and reagents is handled by the individual who placed the order. Upon receipt of the supplies, the ordering information is compared with the receiving information. If a discrepancy is found that may affect the quality of the product, the materials are returned. If accepted, a label is affixed to the bottle so that the date received, date opened, and date expires may be recorded. Purchase orders and packing lists are maintained in a central file as a check on materials received. Certificates of analysis are kept in a central file for each analytical group. Material safety data sheets are placed in the MSDS binders and are easily accessible.

The laboratory manager determines the shelf life or, for certain chemicals, a shelf life is provided by the manufacturer. A first-in first-out usage is maintained by the users. The laboratory manager surveys the store room monthly for appropriate storage of items kept there.

The laboratory evaluates the vendors from which we purchase supplies and services. A list of approved vendors is maintained, posted in the laboratory, and available to personnel purchasing supplies and services.

The quality of the reagent or chemical used depends upon the analysis for which it is used. At a minimum "Reagent" grade is used when higher purity grades are not required. High purity acids and solvents are used for metals digestions and trace level organic extractions. If other grades are used, it first must be ascertained that the chemical is of sufficiently high purity to permit its use without lessening the accuracy of the analysis. Refer to the "Purchase of Supplies" standard operating procedure for a list of chemical and reagent grade/quality to be ordered.

Reagents and solvents are stored in borosilicate glass bottles, metal, or polyethylene containers, whichever is appropriate according to method specifications. Reagents and solvents sensitive to light or temperature are stored in dark bottles or in a cool dark place.

Reagent preparations are recorded in a reagent preparation log book and each reagent assigned a log number. All reagents are labeled at a minimum with the name, reagent log number, date prepared and date expires where applicable. The concentration and composition of many reagents are susceptible to change over a period of time.
Blanks, control, or reference samples are analyzed with each set of samples for all analytical procedures to insure that the reagents used have not degraded or become contaminated.

Gases used in the laboratory can be classified to serve one of three functions: fuel, oxidant or carrier. The following is a list of the types of gases used:

Type	Parameter	Use (function)
Air, zero grade	Organic Analysis	Oxidant
Argon	Metals Analysis	Carrier
Helium, UHP	Organic Analysis	Carrier
Helium, HP	Ion Chromatography	Carrier
Hydrogen, UHP	Organic Analysis	Fuel
Nitrogen, UHP	Organic Analysis	Carrier
Nitrogen	Metals Analysis	Carrier
Oxygen	Heat of Combustion	Oxidant
Oxygen	Sulfur Analysis	Oxidant

Air supplied by a compressor is passed through a filter to remove any oil, water, and trace metals from the line. This air supply is used only for enriching dilution water for BODs.

Several grades of water are used in the laboratory: Tap Water, Type II ASTM Reagent Water, and Type I ASTM Reagent Water and water collected specifically for some of our organic analyses. A description of the various waters used follows:

1. Tap Water - The tap water used in the laboratory is from the Billings City water supply. Its primary use is for the washing of glassware and containers.
2. Type II ASTM Reagent Water - This water is produced by passing tap water through a Millipore reverse osmosis system and Barnstead polishing cartridges.
3. Organic Free Water – This water is produced by passing ASTM Type V water through a charcoal bed..
4. Type I ASTM Reagent Water – This higher quality water is produced by treating the Type II water with a Millipore Super Q four bed recirculating system. This water is available on demand at up to 3 gpm.

The electrical conductivity of the deionized water is monitored weekly at various laboratory outlets to verify the quality. The electrical conductivity for the ASTM type I "Q3" water is to be 3 umhos/cm or less. The conductivity of the ASTM type II water is to be 5 uhmos/cm or less.

The type of glassware and its cleanliness are important factors in obtaining accurate analytical results in the laboratory. The cleaning method for the glassware is dependent upon the substances that are to be removed and the use of the glassware. Special cleaning techniques are published in our Standard Operating Procedures Manual.

9.0 TRAINING

Laboratory employees are trained to perform the tasks assigned to them. This consists of on-the-job training. Short courses and specialty conferences are included when appropriate. All technical personnel are required to attend an indoctrination program administered by representatives of the laboratory manager. The indoctrination program covers employment requirements, policies, safety and laboratory procedures, and objectives of Northern Analytical Laboratories, Inc. A copy of the quality assurance program is provided and time is assigned for its review.

All new employees are considered probationary for a period of six months from the time of employment. The training program for new personnel is administered by the laboratory manager. The trainee is required to read the appropriate standards, methods or standard operating procedures and to become familiar with the equipment and measurements used in testing. The trainee observes an experienced operator perform the tests and then performs the test under the direct supervision of the operator.

Before any test is performed by a trainee without direct supervision, an experienced analyst observes the trainee performing the test and then initials the trainee's "Personnel Proficiency Check Sheet" (Figure 9-1). Maintenance of the proficiency check sheet system is the responsibility of the laboratory manager. The personnel proficiency check sheets are filed in the employee's training file. A summary of the tests for which any employee has been trained is placed in the employees training file and is reviewed annually by the laboratory manager.

It is Northern Analytical Laboratories' policy to provide for the continuing training and development of its technical personnel. The program is administered by the laboratory manager and provides for the following:

- Selected external programs for attendance by key personnel.
- Selected special training for specialized positions or for newly created positions may include assistance for attendance at accredited educational institutions. The laboratory manager has the responsibility for selecting and recommending participation in these programs.
- The laboratory manager will review and evaluate the development programs once a year regarding the effectiveness of the programs and changes to be made.

10.0 SAFETY

Appropriate safety techniques and procedures are required with the continual expansion and sophistication of techniques, chemicals and equipment used in an environmental laboratory. It is never assumed that personnel at any level of work have adequate information about laboratory safety. For this reason, the need for a training program is recognized to insure a safe laboratory environment.

This program involves the availability of proper safety equipment and adequate personnel training. The following is a list of the safety equipment located in the laboratory:

- Emergency shower
- Eye wash fountain
- Eye wash solution
- Fire extinguishers
- First aid kit
- Thermal gloves
- Safety glasses
- Laboratory coats
- Fume exhaust hoods
- Face shields
- Explosion shield

Fume hoods are provided in the laboratory for safe use of gaseous or toxic reagents. The reagents are stored in proper containers at ambient temperature in specifically designated areas of the laboratory. These areas are segregated to avoid contact of incompatible hazardous materials. Proper grounding of electrical equipment in the laboratory is inspected and monitored as a part of the routine preventative maintenance program.

A hazard communication program is in place in the laboratory. Full details of the laboratory safety program is given in the Chemical Hygiene Plan.

11.0 ANALYTICAL METHODS

The analytical methods used by the laboratory for the analysis of samples have been selected based on the needs of the client. Methods validated by U.S. EPA, NIOSH, the OSHA Technical Center, ASTM or other recognized method publication group will be used. Our laboratory does not design or validate methods for sample analysis. When methods are modified for use, modifications are made based on sound chemical principals and approved by the direction of the laboratory manager.

Before a new method is used for the analysis of client samples, an initial demonstration of capability (IDC) is performed to demonstrate that the laboratory can produce accurate and precise results. The IDC consists of the analysis of four quality control samples and a method detection limit study. The quality control sample may be purchased from an outside source or prepared by laboratory personnel. The individual and average recoveries are calculated along with the relative standard deviation. These results are compared with criteria specified in the method.

Methods for analysis of water and wastes have been documented by the U.S. Environmental Protection Agency as approved methodologies, under the National Pollutant Discharge Elimination System (NPDES) Permit Program, Clean Water Act (CWA), Safe Drinking Water Act (SDWA), or the Resource Conservation Recovery Act (RCRA). Methods for the analysis of materials for asbestos are from NIOSH Manual of Analytical Methods and EPA's Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA 600/R93/116. Industrial hygiene samples are analyzed in accordance with methods published by NIOSH, the collection device manufacturer or OSHA.

The analytical methods used by the laboratory are given in Table 11-1 and are from the following sources:

1. EPA/600/4-79-020 "Methods for Chemical Analysis of Water and Wastes"
2. EPA/600/R-94-111 "Methods for the Determination of Metals in Environmental Samples" Supplement I
3. EPA/600/R-93-100 "Methods for the Determination of Inorganic Substances in Environmental Samples"
4. "Standard Methods for the Examination of Water and Wastewater" 18th edition
5. SW-846 "Test Methods for Evaluating Solid Waste", 3rd Edition with updates I, II, IIA, IIB, III

6. Code of Federal Regulations , Title 40, Part 136
7. EPA/600/R-95-131 "Methods for the Determination of Organic Compounds in Drinking Water" Supplement III
8. 3M Company method entitled "Determination of Selected Organic Vapors in Air"
9. EPA 1993 Draft Methods entitled, "Gasoline Range Organics" and Diesel Range Organics"
10. US Department of Agriculture Handbook No. 60 "Diagnosis and Improvement of Saline and Alkali Soils"
11. American Society of Agronomy, "Methods of Soil Analysis" American Society for Testing Materials, "Annual Book of ASTM Standards"
12. American Society for Testing Materials, "Annual Book of ASTM Standards"
13. NIOSH "Manual of Analytical Methods", 4th Edition
14. Western States Laboratory Proficiency Testing Program "Soil and Plant Analytical Methods", Version 4.0.
15. USEPA Contract Laboratory Program "Statement of Work for Inorganics Analysis" ILM04.0.
16. Massachusetts Department of Environmental Protection "Method for the Determination of Volatile Petroleum Hydrocarbons (VPH)" and "Method for the Determination of Extractable Petroleum Hydrocarbons (EPH)" Jan. 1998.
17. "Field and Laboratory Methods Applicable to Overburden and Mine Soils" by A. Sobek et al

Standard Operating Procedures are written for the tests that we perform. A list of the laboratories SOPs is given in Figure 11-2. At a minimum these SOPs specify:

- appropriate instrumentation and equipment
- sample handling and preservation
- instrument calibration
- standard preparation
- reagent preparation and standardization
- analytical procedure
- method of calculation of results
- quality control criteria
-

The SOPs are updated as required to remain current with methods of analysis. Outdated SOPs are maintained in a separate file.

12.0 SIGNIFICANT FIGURES

The primary objective is to report all results in such a way that they can be interpreted properly with reference to the accuracy of the test. Numerical data can be calculated with more digits than are justified by the test's accuracy or precision. Data should be rounded to the number of figures consistent with the confidence that can be placed in it. After rounding the last digit of the reported result is doubtful. For example: if the analytical result is reported as 75.6 mg/l the 75 should be quite certain while the 0.6 is uncertain.

When calculating results, the number of significant figures in the reported result cannot be more than the factor that contained the fewest significant figures.

For example: $\frac{0.22 \times 100}{1.0665} = 20.62822...$

but should be rounded to 21 as 0.22 contains the least amount of significant figures (two).

Rounding Off Numbers: The following rules should be used for rounding off numbers to the correct significant places:

	Examples
If number ends in 1-4, round off to smaller number:	364 to 360
If number ends in 6-9, round off to larger number:	487 to 490
If number ends in 5, round off to even number:	365 to 360 375 to 380

Then two or more figures are to the right of the last figure to be retained, they are to be considered as a group in rounding decisions. For example: 2.4(501) would be rounded to 2.5 as the group (501) is greater than 5. 2.4(499) would be rounded to 2.4 as the group(499) is less than 5.

13.0 SAMPLE COLLECTION, CONTAINERS AND PRESERVATION

In order to maintain the integrity of the sample from the time it is collected until it is received in the laboratory for analysis, we recommend the use of proper sample containers and preservatives to our clients for the collection of samples. Upon request, we will supply our clients with appropriate sample containers and preservatives. Instructions for sample preservation are given as are material safety data sheets for each preservative supplied.

The EPA provides guidelines for sample preservation and holding times. A sample preservation table is provided in this section for the analyses that this laboratory performs. This table lists preservation, holding times, sample container, and sample volume required.

The analyses of those parameters with short holding periods – 48 hours or less – are given priority and completed as quickly as possible.

14.0 EQUIPMENT LIST

Following is a list of equipment currently used by the laboratory. Notes are included as to make, model, and generalized calibration requirements. Authorization for individual staff members to use the key instruments in the laboratory is obtained from the laboratory manager. A record of the authorization is kept with our equipment records. This record system includes the identity of devices in use by the laboratory, operators manual location (if one is provided) and notes or comments about the instrument's use.

Type	Model	Manufacturer	Calibration Frequency
Oven	Wooden Cabinet	Classic WoodSam Walter	None
Oven	255D	Fisher	Eash Use
Oven	200A	Blue M	Each Use
Oven	Muffle Furnace	Sybron	Each Use
Oven	---	Despatch	Each Use
Oven	630F	Fisher	Each Use
Oven	1370F	VWR	Each Use
Oven	Muffle Furnace	Thermolyne	Each Use
Incubator	146A	Fisher Scientific	Each Use
Balance	GA110	OHAUS	Daily
Balance	Top loader	American Scientific Products	Daily
Balance	A-30	Mettler	Daily
Balance	7224DA	Fisher Scientific	Daily
Balance	AE100	Mettler	Daily
Balance	A-200 DS	Fisher Scientific	Daily
Balance	Navigator	OHAUS	Daily
Spectro-photometer	Spectronic 301	Milton Roy	Each Use
Turbidimeter	Micro 1000	HF Instruments	Each Use
Infrared Spectro-photometer	FT 57	Biorad	Each Use
Centrifuge	6K	Marathon	None
Shaker	---	Eberbach	None
Air Compressor	---	Sanborn	None
Water Cooler	---	Thermo Jarrell Ash	None
Bomb Colorimeter	1241	Parr	None
Emission Spectro-photometer	ICAP 61	Thermo Jarrell Ash	Each Use
ICP/Mass Spectrometer	ELAN 6100	Perkin Elmer	Each Use
Sulfur Analyzer	S144-DR	Leco	Each Use
Atomic Absorption Spectrophotometer	Video 12E	Thermo Jarrell Ash	Each Use

14.0 EQUIPMENT LIST (cont.):

Type	Model	Manufacturer	Calibration Frequency
3 - Microscope	BHT/2	Olympus	Each Use
3 - Microscope	SPT	Fisher	Each Use
Conductivity Bridge	AR 50	Accumet	Each Use
pH Meter/Ionanalyzer	501	Orion	Each Use
pH Meter/Ionanalyzer	420A	Orion	Each Use
pH Meter	301	Orion	Each Use
pH Meter	AR 50	Accumet	Each Use
1 - Gas Chromatograph	9000	Tremetrics	Each Use
5 - Gas Chromatograph	5890	Hewlett Packard	Each Use
2 - Gas Chromatograph/ Mass Spectrometer	5890/5971	Hewlett Packard	Each Use
1- Purge and Trap	3100	Tekmar	None
3 - Purge and Traps	4460A	O.I. Analytical	Each Use
3 - Purge and Traps	LSC 2000	Tekmar	Each Use
3 - Autosamplers	MPM-16	O.I. Analytical	None
2 – Autosamplers	ALS 2016	Tekmar	None
1- Autosampler	AquaTek 70	Tekmar	None
5 - Autoinjectors	7673	Hewlett Packard	None
3 - Heater Jackets	MHC-16	O.I. Analytical	None
Auto Analyzer	Flow Solution Alk/Cl/SO4/NO3/NH3/TKN/PO4	Alpkem	Each Use
Flash Point Tester	Pensky-Martens	Koehler	Each Use
Hot Water Bath	---	Intedge	Each Use
Sonic Bath	3200	Branson	None
Sonifier	450	Branson	None
Sonifier	---	Heat Systems	None
TCLP Extractor/Rotator	---	Millipore	Each Use
TCLP Extractor/Rotator	---	Our Manufacture	Each Use
3 - Zero Headspace Extractors	---	Millipore	None
2 - Micro Kjeldahl Distillation Apparatus	---	Labconco	None
Block Digester	BD-46	Lachat	None
Block Digestor	Mod Block	CPI	None
20 - Personal Computer	---	Various Models	None
7 - Printers	---	Various Models	None

14 EQUIPMENT LIST (cont.):

1 - Strip Chart Recorder	---	Linear	None
3 - Refrigerators	Isotemp	Fisher Scientific	Daily
1 - Refrigerator	Explosion Proof	Lab Line	Daily
4 - Refrigerators	Under Counter	Kenmore	Daily
2 - Fume Hood	Safety Flow 93-890EQ	Fisher Scientific	Annually
4 - Fume Hoods	---	Various Models	Annually
Biological Hood	---	Labconco	Annually
Deionized Water System	Reverse Osmosis	Millipore	Weekly
Deionized Water System	Milli-Q	Millipore	Weekly
Evaporator	TurboVap 500	Zymark	None
Microsoft NT		Microsoft	
Visual Lab Pro		Prism, Inc.	
Microsoft Word		Microsoft	
Microsoft Excel		Microsoft	
Lotus 1-2-3		Lotus	
Hewlett Packard Chem Station for GC		Hewlett Packard	
Hewlett Packard Chem Stations for GC/MS		Hewlett Packard	
Fast Pac by Alpkem		Alpken/Astoria	
Obsolete or not in use:			
High Pressure Liquid Chromatograph	Waters 600	Millipore	Each Use
UV Detector	757	Applied Biosystems	Each Use
Ion Chromatograph	20001	Dionex	Each Use
1 - Gas Chromatograph/ Mass Spectrometer	5890/5970A	Hewlett Packard	Each Use
2-Ovens	---	Manufacturer unknown	Each Use
Conductivity Bridge	Model 35	YSI	Each Use

15.0 AUDIT PROGRAMS/LABORATORY ACCREDITATIONS

Northern Analytical Laboratories, Inc. participates in many performance evaluation programs. These audits can take the form of simple round robin analyses or formal audits by regulatory agencies. The following is a list of audit programs in which we are currently enrolled:

- Water Supply (WS) Audit - Semiannually
- NIOSH ELPAT Programs for Lead in Paint Chips, Soil, & Dust Wipes Quarterly
- NIOSH PAT Program for Fiber Analysis by Phase Contrast Microscopy, Solvents, and Metals - Quarterly
- NIST Asbestos Identification for Bulk Material - Semiannually

The NIOSH PAT and NIST audit programs support the laboratories industrial hygiene and asbestos services. The WS and NIOSH ELPAT audit programs support the chemical services provided by this laboratory.

Performance evaluation (PE) samples are given a laboratory number and submitted to the lab for analysis in the same manner as a regular client sample. Sample preparation instructions received with the samples are given to the lab staff. In order to ensure that the PE samples are prepared correctly, preparation instructions are to be read and concurred with by two analysts and a second analyst is to observe the preparation. PE samples are to be analyzed in the same manner as a client sample. Multiple analyses of PE samples are not to be conducted and a single, unaveraged, result is to be reported. All required calculations are to be checked by a second analyst. The results recorded on the PE report form are to be checked by a second person for correctness before submittal.

This laboratory is currently accredited by three federal or state regulatory agencies. A list of these accreditations is give in Table 15-1. Copies of accreditation certificates can be provided upon request.

TABLE 15-1

NORTHERN ANALYTICAL LABORATORIES, INC.
LABORATORY ACCREDITATIONS

American Industrial Hygiene Association
2700 Prosperity Ave. Suite 250
Fairfax, VA 22031
Fibers, Metals, Solvents – PAT
Lead - ELPAT

State of Montana
Department of Environmental Quality
Cogswell Building, 1400 Broadway
Helena, MT 59620
Drinking water

National Voluntary Laboratory Accreditation Program
National Institute of Standards and Technology
Building 411, Room A162
Gaithersburg, MD 20899
Bulk Asbestos

17.0 DEFINITION OF TERMS

1. Accuracy - The closeness of agreement between an observed value and its know or reference value.

2 Calibration - To establish a plot of concentrations of known analyte standards verses instrument response to the analyte.

3 Calibration blank - An analyte free water, matrixed and prepared in the same manner as a calibration standard.

4. Calibration standards - A series of known concentration analyte solutions used for the calibration of an instrument.

5. Corrective Action - To respond to and correct a condition that does not meet established quality standards.

6. Duplicate - A second aliquot of a sample that is treated in the same manner as the original sample in order to determine the precision of the method.

7. Laboratory Control Sample (Laboratory fortified blank) - A control sample of know concentration prepared by laboratory personnel that is analyzed using the same preparation and analytical methods as the samples. Used to assess accuracy.

8. Matrix Spike - A second aliquot of a sample to which a known amount of analyte(s) is added. The matrix spike is prepared and analyzed in the same manner as the sample and is used to determine accuracy and matrix effects.

9. Method Blank - An aliquot of analyte free matrix that is prepared and analyzed in the same manner as the samples.

10. Method Detection Limit (MDL) – A statistical calculation of the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined by analysis of seven samples prepared at known concentration and taken through the entire analytical process.

11. Quality Control Sample - A control of certified concentration purchased from an outside vendor.

12. Practical Quantitation Limit (Reporting Limit) - The minimum concentration of analyte reported to the client. The PQL/RL is project specific and is determined by the laboratory method detection limit, applicable regulatory limits, client requirements and sample matrix.

13. Precision - The agreement among a set of replicate measurements without assumption of knowledge of the true value.

14. Surrogate - An organic compound added by the laboratory to the sample prior to extraction and analysis which behaves in a similar manner to the target analytes but which is not normally found in environmental samples. Used to access accuracy and matrix effects.